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AMERICAN
DYESTUFF REPORTER

Devoted to Textile Chemistry
BLEACHING • DYEING • PRINTING • FINISHING

TEXTILE MACHINERY EXHIBITION NUMBER

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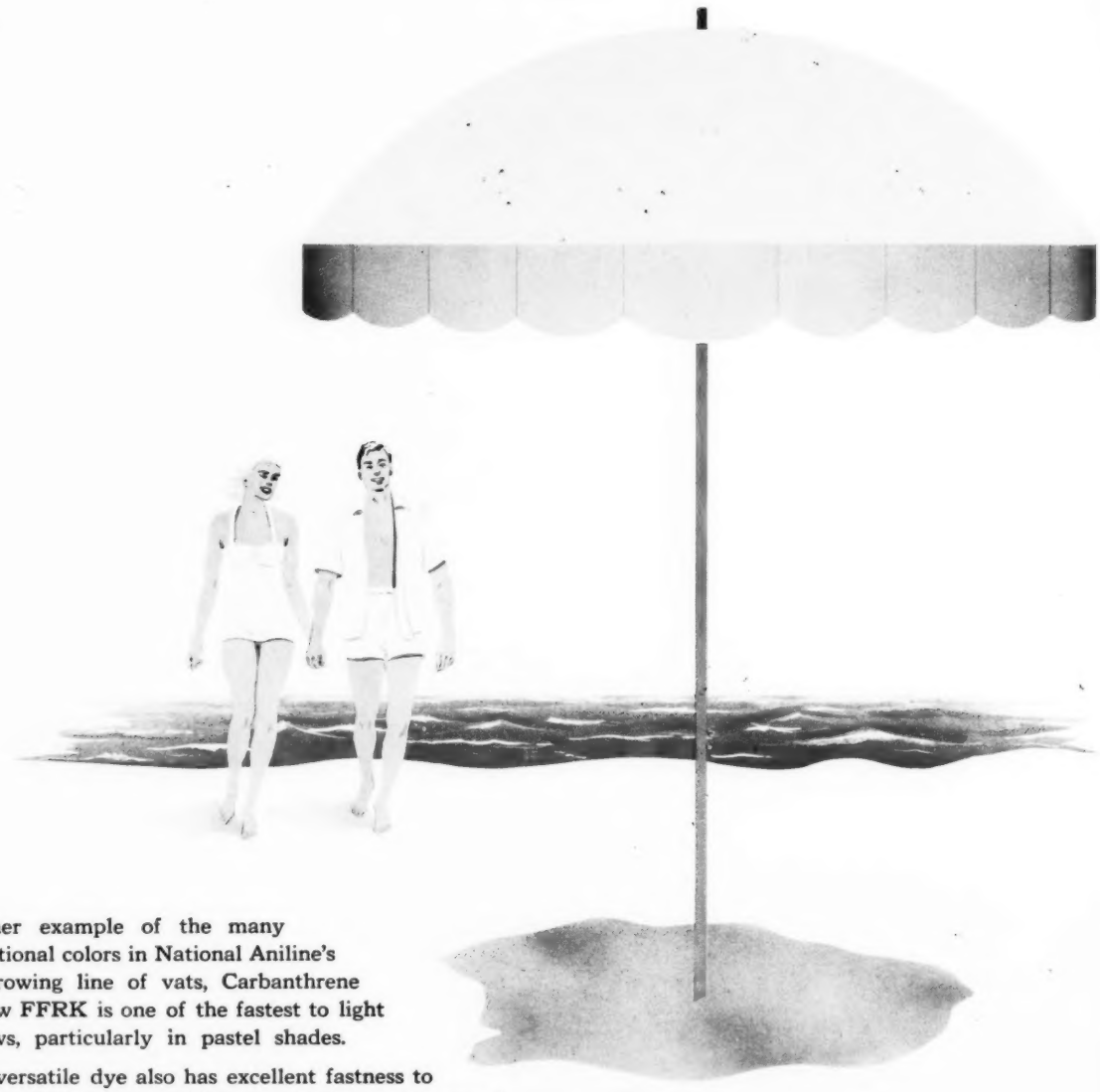
exceptional in pastels

for sun, surf and sports wear

NATIONAL CARBANTHRENE YELLOW FFRK PASTE



Another example of the many exceptional colors in National Aniline's fast-growing line of vats, Carbanthrene Yellow **FFRK** is one of the fastest to light yellows, particularly in pastel shades.

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Phone our nearest office for working samples of Carbanthrene Yellow **FFRK**, for technical help on any difficult dyeing problem or for prompt delivery on your routine dyestuffs needs from warehouse stocks.

NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N. Y.

Boston Providence Philadelphia Chicago San Francisco Portland, Ore. Greensboro Charlotte Richmond Atlanta Columbus, Ga. New Orleans Chattanooga Toronto

Allied Chemical

TEXTILE MACHINERY EXHIBITION NUMBER

AMERICAN

DYESTUFF REPORTER

VOLUME 43 APRIL 12, 1954 NUMBER 8

1954 American Textile Machinery Exhibition

ATLANTIC CITY, N J

April 26-30, 1954

ATLANTIC CITY's Convention Hall will open its doors on April 26th for what many trade sources predict will be the largest textile machinery exhibition in American history. The quadrennial event will run through April 30th under the auspices of the American Textile Machinery Association. The first American Textile Machinery exposition was held in Atlanta in 1881, and the event has grown to be one of the most important of its kind in both size and scope.

Attendance at this year's show is expected to be well above the 20,000 figure set at the 1950 Exhibition, which included visitors from the U S and 35 foreign countries. Several of the nation's textile schools will be sending their entire student bodies as well as a large proportion of faculty.

Most of the approximately 300 exhibitors will be located in the main auditorium, while additional displays, restaurant facilities, ATMA offices, and press facilities will be located on the second level.

ATME visitors are cordially invited to visit Booth 834, where AMERICAN DYESTUFF REPORTER representatives Norman Johnson, Myron Reeser, Herbert Stauderman, and Charles Whitehead will be in attendance.

SHOW HOURS

Monday, April 26.....	10 am to 6 pm
Tuesday, April 27.....	10 am to 6 pm
Wednesday, April 28...	10 am to 10 pm
Thursday, April 29....	10 am to 6 pm
Friday, April 30.....	10 am to 6 pm

Main Auditorium, Atlantic City Convention Hall. A Partial View of the 1950 Textile Machinery Exhibition.

ANN P SMITH, a senior at the North Carolina State College School of Textiles has been judged the first-prize winner in an essay contest on "Why Textile Management and Operating Personnel Should Attend the American Textile Machinery Exhibition of 1954." Other winners include Florian J Weissenborn of Lowell Technological Institute, second place, and Edward Marcus of Philadelphia Textile Institute, third place.

More than 400 contestants from the ten colleges included in the National Council for Textile Education entered the contest, which was sponsored by America's Textile Reporter. In addition to the three prize winners, seven other "preliminary" winners will receive $100 and an all-expense paid trip to the Atlantic City show. The trips are being given by the ATME committee. Miss Smith will be awarded $500 for her winning essay.

All winners will be guests of honor at a dinner on Wednesday, April 28, which has been designated Textile Career Day. Deans of the 10 textile colleges will also be guests at the luncheon.

SEVERAL trade and school functions have been scheduled for Atlantic City during the week of the American Textile Machinery Exhibition, including the regular meetings of the AATCC Council and Technical Committee on Research. The TCR meetings will be held April 29-30 at the Hotel Dennis. The meeting of the Council will also be at the Dennis on April 30.

Among the school functions will be the Reunion of Lowell Technological Institute Alumni on April 28 at the Haddon Hall.

Exhibit Information

FOLLOWING is a selective, alphabetical list of exhibits at the 1954 American Textile Machinery Exhibition, which will be of primary interest to those engaged in the wet-processing, testing and allied fields of the textile industry:

AETNA FELT COMPANY, INC

204 Centre Street
New York, N Y

Booths 876-877

On display will be woven and pressed felt including a complete line of decating cloths for finishing of woolens, worsteds, rayons, synthetics and blends. Also to be shown are vibration felt pads and felt parts such as box front felts, friction washers, binder strips, pressure roll felt, etc.

In attendance: William P Musselman, President; Dan Vlaun, Sales Manager; Carl T Keppler, New England Representative; Clark Outcault, Pennsylvania Representative; Frank Hickey, Southern Representative.

AMERICAN STANDARD FABRICATORS CORPORATION

355 Walton Avenue
New York 51, N Y

Booths 817-818

A complete laboratory unit for sample dyeing, extracting and drying will be in operation. Mills have been invited to bring their own wound packages to be processed. Also on display will be a stainless steel dye beam.

In attendance: George T Kreis, Maxwell F Morris, Nicholas N Manfra and G H Jerry Boyd.

AMERICAN VISCOSE CORPORATION

1617 Pennsylvania Blvd
Philadelphia 3, Pa

Booths 358-359

The Avcoset program for the quality control of washable rayon fabrics will be dramatized. Procedure for becoming a licensee under the program, the testing procedure used to police it, and the advertising and merchandising being done to promote it will be outlined.

In attendance: George L Storm, Manager of Rayon Staple Sales; Malcolm V Macfarlan, Manager of Filament Rayon Sales; John C Wilmerding, Manager of Acetate Sales; Frank T Williams, Manager of Tire Yarn Sales; Thomas H Andrews, Manager of Filatex and Vinyon Sales; John W Geary, Jr, Manager of Export Sales; Arthur R Wachter, Manager of Converting Relations (in charge of Avcoset program); Walter E Scholer, Manager of the Fabric Development Department; Frank F Hilson, Manager of the Exhibit.

ANDERSON MACHINE SHOP INC

Brook Road
Needham Heights 94, Mass
Booths 561-562

On display will be the Pacific Evenness Tester for testing unevenness and weight of yarn, roving and sliver; the Pacific Integrator for obtaining the coefficient of variation and standard deviation of the material being tested; the Pacific Raw Stock Waste and Staple Cutter.

In attendance: J G Anderson, President; G R Anderson, Vice President; A G Anderson, Sales Manager.

ANDREWS & GOODRICH, INC

336 Adams Street
Dorchester, Mass

Booth 78

A gas-fired vapor dryer with a control cabinet will be exhibited.

In attendance: B R Andrews, Sr, B R Andrews, Jr, P L Goodrich, R C Taft and H F Rehling.

ARMCO STEEL CORPORATION

Middletown, Ohio
Booths 292-293

This exhibit will consist of a display and demonstration of Armco stainless steels used in wet processing equipment. Special items to be featured will include Armco ELC stainless steel to prevent weld area corrosion and Armco aluminized steel for dryers and other equipment requiring heat-resistant steels.

In attendance: G H Klouman, engineers and technicians.

ARMSTRONG MACHINE WORKS

Three Rivers, Mich
Booth 917

A glass model of the Armstrong inverted bucket steam trap, operating on steam at 7 lbs pressure, will be demonstrated. Also to be exhibited is the Armstrong steam humidifier.

In attendance: T H Rea, Sales Manager.

ASKANIA REGULATOR COMPANY

240 East Ontario Street
Chicago 11, Ill
Booths 844-845

This exhibit will feature the Askania "Pneu-Draulic" cloth guide control together with an actual demonstration of tenter roll control on a clip type tenterette. The air hydraulic tenter rail control will be exhibited for the first time at a textile industry exposition.

In attendance: W W Wheeler, R J Matteson, R J Kroth, W Vaaler and Frank J Markey.

BIRCH BROTHERS, INC

32 Kent Street
Somerville 43, Mass
Booth 397

On exhibit will be the following equipment: "Supreme" butt-seam grey room portable sewing machine; "Coronation" high lift motor-operated portable chain stitch sewing machine; "Excel" portable chain-stitch sewing machine, foot operated; standard tacking machine head; ball bearing counterbalanced tacking machine head; high speed ball bearing scutcher; brass scrimp rail; angular guide; conical opener or spreader; adjustable spiral opening roll unit; three-bar curved rubber expander; bristle stretcher brush; patent adjustable slot vacuum extracting box; two-roll padder model. Large sized photos will be shown of other equipment.

In attendance: Harold W Birch, Manager; Clifford W Birch, Jr, Sales Engineer; Richard Briggs, Sales Engineer; Francis W Birch, Salesman.

BRUSH ELECTRONICS COMPANY

3405 Perkins Avenue
Cleveland 14, Ohio
Booths 822-823

The Uniformity Analyzer, an instrument which measures the irregularities in weight per unit length of yarn, rowing and sliver, will be shown. A new instrument, the Tension Analyzer, which measures the variations in tension in any filament yarn or wire, will also be exhibited.

In attendance: D Gaskill, A Ondis, W R Stern, E Hensley and H Schechter.

BURLINGTON ENGINEERING CO, INC

Graham, North Carolina
Booths 9-10

This exhibit will feature the Burlington pressurized bleach, boil-off and dyeing machine for tricot and the Vacuset machine for preshrinking and setting all high-twist and elastic yarns.

In attendance: J Saunders Williamson, President; Walter J Newcomb, Secretary and Sales Manager; D L Lomax, Engineer.

H W BUTTERWORTH & SONS COMPANY

Philmont Road
Bethayres, Pa
Booth 539

Machinery to be shown includes: a scale model of a new type printing machine designed for easier color register than conventional machines now in use; the new EMCO rotary cutter winder featuring new roller bearing arms, roller bearing jaws, and rotary knife cut-off; a cylinder drying machine featuring improved cylinders of copper or stainless steel, coded or uncoded; a pressure boil-off jig; an embossing calender; a padder featuring standardized roll sizes which offers a choice of pneumatic or micro-set pressure systems with pressures up to 15 tons and a choice of 2- or 3-roll models.

In attendance: J Ebert Butterworth, President; DeHaven Butterworth, Vice President and Sales Manager; Frederick N Spoerl, Assistant Sales Manager; Thomas H Davis, Jr, DeHaven Butterworth, Jr, C Eugene Hunter, Jr, James E Butterworth, Jr, Sales Engineers; J Hillman Zahn, Manager of Southern Office; Wallace Taylor, Manager of New England Office; Edward S Pierce, General Manager; Stanley Brooks, Chief Engineer; J J Sipple, Manager of Rayon Division.

CHEMICOLLOID LABORATORIES, INC

30 Church Street
New York 7, N Y
Booth 846

Two new models of the Charlotte Colloid Mill will be exhibited: the ND-2 and the ND-5. Charlotte colloid mills are used in the dyehouse for dispersion of color, in print works for the cutting of clear emulsion and dispersion of the printing paste.

In attendance: David F O'Keefe, President; E E Ball (Watson & Desmond, Charlotte, N C); Russell Anderson, Walter A Behrens and Leroy E Putnam.

COOK-P & N MACHINE CO, INC

365 Dorchester Avenue
Boston 27, Massachusetts
Booths 73-74-75-76

This exhibit will include a new tensionless dye jig featuring many automatic features. A new patented horizontal automatic cloth storage scray will also be shown in operation. It is claimed that this machine has increased production by 15% in cloth printing departments.

In attendance: Perce Cook, James Cook, Ernest M Cook and John M Stearns.

CORN PRODUCTS SALES COMPANY

17 Battery Place
New York 4, N Y
Booths 1025-1026

Samples of products will be shown.

In attendance: H Baker, H Harris, J Kulz, W Bailey, J Hill, A Simpson, L Kelley, W Joyner, P Donaghy and A Harden.

CURTIS & MARBLE MACHINE CO

Worcester 3, Mass
Booths 134-135-136-137

The type #54 air-operated cloth folding machine will be exhibited. Features of this machine include welded steel construction, increased capacity, less floor space and reduced maintenance requirements, a driven unrolling attachment with synchronized drive for feeding-in rolls allowing use of a small scray, V-belt drives including variable speed drive with speed reductor unit eliminating pulleys, self-aligning ball joints for crank connections, small pivoted air cylinder, and improved blade motion resulting in smoother running.

In attendance: Walter F Woodward, Southern Representative; Robert E Steere, New England Representative; Leland F Remington, General Superintendent; Frank MacKay, Road Man; Roger H Marble, Secretary; George E Marble, Vice President; Ralph Gamble, Engineer; Frederick Travers, Service Man.

THE FELTERS COMPANY

210 South Street
Boston 11, Mass
Booth 39

Unisorb, a specially developed felt pad used to install machinery without the use of lag screws or bolts, will be featured.

In attendance: P N Wheeler, J W Morrison, C H Sykes, Jr, N A Hill and R V Dwyer. From the Industrial Supply Co, Clinton, S C, Southern distributors: R E Ferguson, R E Ferguson, Jr, L R Ferguson and J Gilfillan.

FIELDEN INSTRUMENT DIVISION
Robertshaw-Fulton Controls Company

2920 North 4th Street
Philadelphia 33, Pa
Booths 803-804

The following instruments will be exhibited: Fielden Drimeter for moisture control; Fielden new super yarn evenness analyzer; Fielden AC resistance bulb thermometer recorder; Fielden new series 97 temperature controller, Fielden Tektolog for tachometer recording and control; Fielden wool carding equipment.

THE FOXBORO COMPANY

Foxboro, Mass
Booth 353

This exhibit will include the Model 40 Cyclelog Controller for automatic regulation of time-temperature schedules and a flow control system for package dyeing machines. Also on display will be instrumentation for precise control of pneumatic loading equipment as well as an instrument for the control of mill humidity.

In attendance: Industrial engineers as follows: H H Michelmore, Boston; R E Beers, New York; G Hammer, Philadelphia; G E Clark, Baltimore; S C Alexander, Charlotte; W W Barron, Greenville, E W Prendergast, Atlanta; W H Ridley and J W Gordon, Foxboro; E J Exworth, Montreal.

FRANKLIN CONTROL CORPORATION

1975 South Allis Street
Milwaukee 7, Wisconsin
Booth 816

Exhibited will be two magnetic amplifier adjustable speed Franklin drives. These tubeless electrical drives, being exhibited for the first time anywhere, are said to have the wide speed range and good regulation of electronic drives but use no tubes of any kind and therefore greatly simplify maintenance problems.

In attendance: F S Malick, President and R W Moon, Secretary-Treasurer.

GASTON COUNTY DYEING MACHINE CO

Stanley, North Carolina
Booths 82-83

This exhibit will consist of a lighted panel containing photographs of various Gaston County dyeing machine installations. Two one-tenth scale model dyeing machines and a five-pound laboratory dyeing machine, complete with automatic controls, will also be shown.

In attendance: G H Hacker, Vice President and Sales Manager; R P Craig, Vice President and Secretary; G Lindner, Export Manager; Gordon Hacker, Assistant Sales Manager.

GENERAL PLASTICS CORPORATION

165 Third Avenue at East 26th Street
Paterson, N J
Booth 914

Textile machinery which has been coated with Teflon will be shown. The use of these coatings is said to have eliminated or greatly reduced the sticking and buildup of sizing materials, dyes, etc, resulting in improved product, increased production and reduced down-time.

In attendance: Robert Goldsmith, President; M W Goldsmith, Vice President; Robert S Hess, Assistant to President; Walter Hassler and Joseph D Ezechel, Jr.

DAVID GESSNER COMPANY

41 Fremont Street
Worcester 3, Mass
Booths 201-211

Featured at this exhibit will be a new napper and center wind. The new napping machine is said to offer the following advantages: control for varying the torque of the napper rolls, self-correcting speed controls for napper rolls, positive inspeed control, and infinitely variable tension control and tension indicator.

In attendance: John P Franklin, President and Richard C Franklin and Richard L Bernard, Salesmen.

THE GIRDLER CORP

224 East Broadway
Louisville, Kentucky
Booths 52-53

The Votator apparatus will be exhibited.

HERMAS MACHINE CO, INC

225 Warburton Ave
Hawthorne, N J
Booth 341

Exhibited will be a new selvedge trimmer, an inspecting and measuring unit and a mixer for inks and colors.

THE HEWSON COMPANY, INC

443 Broad Street
Newark 2, N J
Booth 58

Exhibited here will be: TAKK high speed static control systems; TAKK high voltage D C insulation test sets and power supplies: Staticator Master static alarm systems; accessory items.

In attendance: John K Hewson, President; Walter E Krause, General Manager; Thomas A Collier and J C Bone.

RODNEY HUNT MACHINE CO

Orange, Mass
Booths 159-164

The Rangette, a small but complete single-stage continuous bleaching unit, will be shown. The equipment, consisting of a Rangette Tensitrol rope washer, saturator, J-box, and another Tensitrol rope washer will be demonstrated running dry with fabric. This peroxide bleaching unit was developed to yield a high degree of efficiency and quality comparable to that obtained on conventional larger-sized continuous bleaching ranges but at production rates of only 240 to 1500 pounds per hour.

In attendance: L M Phillips, Assistant Sales Manager; E F Harris, Executive Vice President; J W Rembe, Sales Manager; H H Belcher, Director of Engineering; M G Hopkins, C H Amidon, F L Wilkinson, L F Tumey and R F Powers, Sales Engineers; T W Kitchen and L V Neese, Southeastern Sales Representatives; N W Pandell, Assistant Chief Engineer.

JAMES HUNTER MACHINE CO

North Adams, Mass
Booths 218-221, 228-231, 113-114

Featured in operation will be a three-piece finishing range including the new tensionless gas fired Vapojet superheated steam dryer, a new heavy duty Hunter 3-Roll Padder, and a Marshall and Williams Clip tenter frame equipped with the Hunter clip tenter overfeed device. Hunter's Barotor machine for high temperature dyeing will also be observed in operation. Other items to be seen are a controlled tension, automatic jig made under license from a European manufacturer and the Whirl-Away ball bearing expander roll.

In attendance: James H Hunter, Vice President; Frank B Morrill, Chief Engineer; E C Rust, Director of Research; Julian Woodworth, Ernest Cannity, Everett Burdick, Carl Endlein, Robert Welsh and Harry Creegan.

THE JOHNSON CORPORATION

805 Wood Street
Three Rivers, Mich
Booth 349

Series 2000 Type J, pipe supported and rod supported, Johnson Rotary Pressure joints will be shown. Also exhibited will be the Series 2000 and Series 3000 Type S self-supporting Johnson Rotary pressure joints.

In attendance: R O Monroe, President; W. R. Monroe, R W Gotschall, T O Monroe and J L Reed, Regional Sales Managers; C Wilson Gil', James Corce, William T Harding, Jr, T H Abbey and John R Greenhalgh, District Representatives.

WALTER KIDDE & COMPANY, INC

Belleville 9, N J
Booths 44AA-44BB

Exhibited will be the Kidde Standard Tension Compensator, the Kidde Double Disc Tension Compensator, the Kidde Warp Compensator, the Kidde tension control, and a prototype of a single-end cord processing machine for use in treating cotton for various industrial use; as well as wool and a new type of rayon for the rug industry.

In attendance: E L Herbert, D M Kroll, J H O'Blenis and F H Muller.

MARSHALL AND WILLIAMS CORP

46 Baker Street
Providence 5, R I
Booths 212-217

On display will be the following: Marshall and Williams high speed tenter frame equipped with overfeed equipment and Universal clip, Marshall and Williams tensionless batcher, tenter clips and chain.

In attendance: Richmond Viall, President and Treasurer; John C Nash, Sales Manager; Fred H Land, Southern Manager; James A Love, Export Manager; G H Curtis, Superintendent; E E Ford, Sales Engineer.

MAWACO MACHINE COMPANY

56 Bogart Street
Brooklyn, N Y
Booths 127AA-127BB

A small semi-decating machine, the New Yorker, will be shown.

In attendance: Walter Schlaepfer and Otto Lepple.

McKIERNAN-TERRY CORPORATION

Harrison, N J
Booths 708-709

A new multi-purpose calender, especially designed for resin finishes, will be exhibited. The calender is designed for quick changeover for friction, Schreiner or embossing surfaces. A cotton-filled calender roll, complete with hydraulic method of bearing removal, will also be shown.

In attendance: Ken Johnson, Textile Machinery Engineering Department; Bruce Stewart, Dover Engineering Department; B M Jones, New England Sales Representative; Laurie E Whittelsey, Southern Sales Representative; Bernard Kaiser, Central Territory Salesman; John C Smaltz, President; Carl W Shattuck, Vice President in Charge of Dover Operations; Robert M Fortune, Harrison Sales Department; J W Wilkinson, General Sales Manager.

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

Wayne and Windrim Avenues
Philadelphia 44, Pa
Booth 275

The following items will be on exhibit: a low range radiamatic pyrometer; the flow meter receiver; a new model 604P5 remote bulb thermometer; a new series 800 diaphragm valve.

In attendance: E Andrews, Industry Manager, Textile Industry, A F Day, W A Munz, E J Klein, J J Horner, J D Root, H L Russel, G A Stiftinger, A Whitcraft.

MORRISON MACHINE CO

1171 Madison Avenue
Paterson, N J
Booth 433

The following machines will be shown: tight strand washer, 8-can hi-pressure vertical dryer, rubber belt type compressive shrinking machine, standard finishing tenter, raw stock dyeing machine, Genray process for continuous vat dyeing of heavy shades on rayon.

In attendance: James L Morrison, President; John C Morrison, Vice-President; A V Caporossi, Sales Engineer; John Kreeft, Chief Engineer; Harold Lacey, Sunperintendent; Erwin Wenz, Assistant Superintendent; D M McSpadden, Southern, Byram Scantland, Southern, A C Freeman, Jr, Northern, H Irano, Japan, K T Lendt, Europe, G R Weber, Brazil, Wm A Silby, Mexico and A Alomar, Colombia, Sales Representatives; Donald G White, Assistant Treasurer; William D Heatherington.

MOUNT HOPE MACHINERY CO

15 Fifth Street
Taunton, Mass
Booths 370-371

The following equipment will be displayed: controlled expansion guide for controlling, automatically and acurately, both widthwise stretch and lateral alignment of fabrics and plastic films; improved mounting bracket (Model MNP) for Mount Hope free wheeling expanders; Model G nonlapping continuous roll feed; com-

plete line of free wheeling expanders; free wheeling expander "Vari-Bow;" open width tension device; Model B bowed and skewed weft straightener; selvedge uncurlers.

In attendance: J D Robertson, President; John B Hammett, Manager; Forrest C Ames, Sales Manager; Walter P Murray, Executive Engineer; complete force of sales representatives.

A B MURRAY CO, INC

Elizabeth, N J
Booth 867

Stainless steel tubing and samples of carbon and stainless steel pipe tubing and fittings will be shown.

In attendance: George Root, William Gunlack, Richard Zott and William Weber.

J M NASH CO

2360 N 30th Street
Milwaukee, Wis
Booth 614

Finishing machinery and sanders will be exhibited.

NATIONAL DRYING MACHINERY CO

Hancock and Lehigh Ave
Philadelphia, Pa
Booth 33

Models of various types of dryers will be shown.

In attendance: Ralph C Parkes, David A Colker, H Mason Clark, Jr, A M Zeller, Jr, Harold O Kaufman and John C Nihill.

NATIONAL STARCH PRODUCTS, INC

270 Madison Avenue
New York 16, N Y
Booth 315

Starches will be shown here.

In attendance: I L Dowdee, C A Dyer, D R Lassiter, H C Olsen, W H Stone, H M Smith, F N Eastwood, E J Maslanka, G J Ouellette and J F Fitzgerald, Assistant Vice President in Charge of Starch Sales.

NORCROSS CORPORATION

247 Newtonville Avenue
Newton 58, Mass
Booth 400

Recording and recording-controlling viscometers for process control applications will be exhibited and will feature the Sizeometer for automatic preparation of warp sizing and a new model recording viscometer for quality control in synthetic fiber manufacturing, warp and single end sizing, and coating or impregnating finishing processes.

In attendance: Austin S Norcross, Frederick J Eimert, Robert S Davis, Jr, Robert A Norcross and Ralph E Howell.

PENICK & FORD, LTD, INC

420 Lexington Avenue
New York 17, N Y
Booth 590

Corn starches, dextrines, gums, sugars and syrups will be displayed.

In attendance: D P O'Connor, Vice President; H A Horan, General Bulk Sales Manager; P G Wear, G M Anderson, T N Nelson, W J Kirby and D F Lowry.

PERFECTING SERVICE CO

332 Atando Avenue
Charlotte, N C
Booth 26

A new rotary union will be exhibited.

In attendance: W G Renner, R W Rousch, F B Taylor and A J DeMeyers.

B F PERKINS & SON, INC

Holyoke, Mass
Booths 130-131-132-133

On display will be calender rolls of various types, three types of Mullen testers and hydraulic power unit, and an illuminated display of other textile machines.

In attendance: B F Perkins, Treasurer; J Lewis Perkins, President; C A Potter, General Manager; Ben Ashley, Chief Engineer; Thomas Kane, Textile Finishing Machinery Specialist; B Q Haynes, Manager, Mullen Tester Division; E Herder, Superintendent, Machine Shop; S Butler, Erecting Department; Eric Norman, Sales Department; Tom Kavanagh, Sales Representative; Harry Gillead, Assembly; William Garen, C Stevens, William Greenwood and H Gelhart, Engineers.

PROCTOR & SCHWARTZ, INC

7th and Tabor Road
Philadelphia, Pa
Booth 506

Machinery in operation will include: the new Proctor card for synthetics; the Proctor preboarding machine for nylon hosiery; the new Proctor loop dryer and curer; new Proctor tenter housing; the Proctor Con-O-Matic washer; a model of a complete fiber blending system. The following will be shown pictorially and diagrammatically: Proctor loop ager; Proctor-Mathieson open width steamer; Proctor hot air slasher dryer; Proctor multipass airlay dryer; Proctor impact dryer for stock; Proctor continuous bleach system for tubular knit goods. Latest data on the Redman Process will be available through representatives of Redman Process American Corporation.

In attendance: Myron T Fleming, Albert G Blank, Harmon B Riehl, John H Senior, C W Schwartz, 4th, Denver Cunningham, Thomas A Mahan, William H Poole, Jack Franklin, Jack Wilson, Don Glassford, C S Tiers, W J Merrigan, R M Gracie, George Clee, E W Gehrung, John Powischill, Edward Hyde, Albert Steinruck, G R Howard, John W Reinhard and Parke L Schaffer. Also the following branch managers: John R Schenck (Charlotte), C W Schwartz, 3rd (Providence), Warren A Dickinson, Jr (Chicago), T J Wilson, Sr (Chicago), T J Wilson, Jr (Chicago), Joseph P Christ (Spartanburg), James M Lurwick (Cohoes) and H R Zayotti (Newton Upper Falls).

REPUBLIC STEEL CORPORATION

Republic Building
Cleveland 1, Ohio
Booths 585AA-585-586

Featured will be textile manufacturing products of Republic's customers fabricated from Enduro stainless steels. Also featured will be Republic's titanium which is said to have outstanding corrosion resistance and desirable strength and light weight characteristics. Also to be featured is plastic pipe which is available in either semi-rigid butyrate type or flexible polyethylene type.

In attendance: Jack Fishel, Sam Seckler, Gene Rowland, Bill Schnackel, Bill Resiner, Tom Perry and Mac McDaniel.

RIGGS & LOMBARD, INC

Foot of Suffolk Street
Lowell, Mass
Booths 232 to 234 and 241 to 243

Two bowls of the Laxloop continuous washer will be demonstrated in operation. The washer is said to be an improved, flexible vari-speed machine for light and heavy weight fabrics of wool, worsteds or blends. By means of Free-Loop Electri-matic compensators, each unit is kept in step so that cloth is tensionless throughout the range.

In attendance: H C Riggs, President; C J Lombard, Vice President; J W Malloy, Sales Manager; L T Parkman, Sales Engineer; H R Wilcox, Chief Engineer.

SCOTT TESTERS, INC

101 Blackstone Street
Providence, R I
Booth 40

Several current models of tensile testing equipment will be exhibited as follows: a complete unit incorporating the "Accr-O-Meter" weighing system which weighs on the electronic principle; the new Clemson flat bundle fiber tester; the Model X-3, a tensile tester for recording single-strand breaks on threads and cords, recently adapted for testing tearing resistance of woven textiles.

In attendance: D C Scott, Jr, H W Horton, John Klinck (Southeastern Sales Representative) and John E Hargreaves (Scott Testers [Southern] Inc).

SEYDEL-WOOLLEY & COMPANY

748 Rice Street, N W
Atlanta, Ga
Booth 918

The following equipment will be exhibited: Niagara twist-setter yarn conditioning machine which contains some new up-to-date features; the over-waxing roll for applying melted wax to the yarn in a dry state and which has been found valuable for Dacron and nylon weaving.

In attendance: Vasser Woolley, President; John R Seydel, Vice President; Dr Paul V Seydel, Vice President; David Meriwether, Manager, Finishing Division Sales; W L Whisnant (Concord), A W LaGrone (Greenville), W H Cutts (Greensboro), V R Mills (Opelika) and F deLoach (Spartanburg), Sales Representatives.

SILL INDUSTRIES

187 Maplewood Avenue
Maplewood, N J
Booth 4

Three products will be featured as follows: the Carbomatic gas-fired Pyro-Jet, a generator for creating high temperature in ovens, tenter housings, etc, to accelerate drying or provide the high temperatures required for resin curing; the Carbomatic gas-fired infra-red Una-Ray, a newly patented infra-red burner with a protective wire mesh screen which successfully keeps all products of combustion away from fabrics; the Sill electric radiant heating panels as used for heat-setting nylon fabrics, hot-stretching synthetic threads, cords and ropes, curing resinous applications to fabrics, drying resinous inks on printing machines, etc.

In attendance: H N Bross, President; T W Walsh, Vice President; B J Lyster and John Bianco, Sales; C S Na and Charles Grant, Engineering.

THE SIMCO COMPANY

920 Walnut Street
Lansdale, Pa
Booth 616

Static eliminating equipment will be exhibited including static bars of many different sizes, shapes and operating characteristics.

In attendance: Julius Simons, President; Harold Schweriner, Applications Engineer; William Rowedder, Textile Sales Representative; Dolph Simons, Engineer.

SMITH, DRUM & COMPANY

432 West Allegheny Avenue
Philadelphia 33, Pa
Booths 55 to 67 inclusive

This exhibit will consist of dyeing and drying equipment with particular emphasis on the new 500-lb hi-temp package dyeing machine and the new 2-kier combination beam and package dyeing machine.

In attendance: H S Drum, R N Smith, W C Dodson, Al Bagian, R W Foltz, W Fuschwanz, A P March and representatives from Parott & Ballentine (Southern representatives).

SONOCO PRODUCTS COMPANY

Hartsville, S C
Booths 71-72

Exhibited will be cones, tubes, cores, spools, cots and bobbins and new products made by the Duroweld process and new plastic single head (King) spools.

In attendance: C H Campbell, J A Reagan, Jr, W B Broadbent, W M Carpenter, W R Peacock, W K Lewis, Jr, P F Williams, A H Gildersleeve, G K Lewis, H P Lamarche, W H Hillsgrove, E J Cotter, C A Burnham, Owen Fayne, W R Gray and O D Duckett.

TAYLOR INSTRUMENT COMPANIES

95 Ames Street
Rochester 1, N Y
Booths 551-552-553

This exhibit will feature control and measurement instrumentation for beam, package and piece dyeing, dye padders and high speed slashers. Instruments include flow recorders, controllers and transmitters, process timers, Ful-Flex controllers, liquid level controllers, volumetric recorders, temperature and pressure gauges, and industrial thermometers. The Taylor differential pressure transmitter is part of the package and beam dyeing automatic control system, designed especially for the textile industry to give a practical measurement of dye liquor flow.

In attendance: F S Ward, General Sales Manager; A J Fleig, Industrial Sales Manager, J S Detwiler, Divisional Sales Manager; H G Olson, Manager, Textile Sales; R J Branigan, New York Sales; J E Anderson, Philadelphia Sales.

TOWER IRON WORKS

50 Borden Street
Providence, R I
Booth 906

A new scray and gas-fired heaters will be exhibited.

TRUMETER COMPANY

1265 Broadway
New York 1, N Y
Booth 612

A line of counters and measuring machines will be shown including an automatic resetting predetermined electro-magnetic machine with totalizer and the MAAG selvedge printing machine.

In attendance: Eric Seligmann, Manager; A Abel, Director of English Plant; H O Jacobus, Assistant Manager; and the following representatives: H E Linderson (New England), G M Westwater (New Jersey), Th Huston (Pennsylvania), E Slaughter, Fred Slaughter and J H Aydeletter (Slaughter Machinery Co, Representatives for the Southern States).

VAN VLAANDEREN MACHINE COMPANY

370 Straight Street
Paterson 3, N J
Booths 503, 504, 517, 518, 517 AA, 518AA, 519, 520

The following machines will be on exhibit: constant-speed tuber; 20-ton, 2-roll pneumatic embosser; combination examiner and tubing machine with automatic selvedge guide; 15-ton pneumatically operated micro-set arrangement 2-roll padder; constant-speed, tensionless automatic dye master jig.

In attendance: C H Van Vlaanderen, President; George Van Vlaanderen, Vice President; C Van Vlaanderen, Treasurer; Guido Ricca and Adolph Barbera, Sales Engineers.

WERNER MACHINE COMPANY, INC

Passaic, N J
Booths 120, 120AA, 120BB, 120CC, 121, 121AA

Equipment to be shown includes: 120" tricot and lace resin finishing pad; 50" deep pattern embossing calender with inlay printing and top tipping attachments; underwater cylinder boil-off and dyeing machine; heavy duty constant lineal speed dye jig of stainless steel construction for 36" diameter cloth rolls; automatic suction slot sealers.

In attendance: Werner P Rose, Alfred R Gessinger and Robert E Kuhn.

WIESNER-RAPP CO, INC

Buffalo 10, N Y
Booth 866

Laboratory-sized versions of a Barotor and a three-roll padder will be exhibited. The W-R design of the Barotor features a patented quick-opening door which eliminates having to bolt and unbolt it. The padder is an improved machine featuring a variable speed motor and a hydraulic pressure system.

In attendance: W W Arnold, Vice President, and Alexander F Schenk.

WINSOR & JERAULD MANUFACTURING COMPANY, INC

1268 Eddy Street
Providence, R I
Booths 100-101-102

A heavy duty cub tenter will be exhibited. A heavy duty high speed T-4 tenter frame head end as well as samples of a new high speed roller chain will be featured.

In attendance: Edward Wharmby, General Manager; Matthew M Zuck, Executive Vice President; Albert J Cole, Manager of Southern Division; Cecil C Keyworth, Head of Sales Department; Edward H Olausen, Shop Superintendent.

• PATENT DIGEST •

PAUL WENGRAF

INCREASING LUSTER by Mercerizing and Calendering G, 2, 01

U S Pat 2,646,341
(Cluett, Peabody Co——Fetscher——
July 21, 1953)

The method for imparting silk-like luster to cotton fabrics by calendering is well known. Pressure exerted on the goods flattens the threads, giving them smooth, reflecting surfaces. However, the flattened fibers have a tendency to return to their original form upon being moistened, e g, in repeated laundering operations, thereby losing their silky hand and lustrous appearance.

Permanent silky luster is reportedly attained by softening and highly plasticizing the fibers in a mercerizing process, partly removing the caustic by rinsing, calendering, rinsing again, etc, thus alternately rinsing and calendering the mercerized goods while maintaining the fabric in a stretched condition. (Special equipment for expanding and tentering the fabrics is described in U S P 2,082,981 (1937) and U S P 1,734,897 (1929), assigned to the same company).

It is essential that the fabrics be given a light rinse after mercerizing as some of the caustic remaining in the fiber causes further swelling. The fibers plasticized in the mercerizing process, which uses NaOH of 15 to 35% strength, are subjected to pressures in a wide range (40 to 15,000 lbs per sq in) by the calender rolls at temperatures varying between 150-350° F. The repeated pressing and intermediate rinsing operations carried out in several steps have the effect of gradually removing the caustic and reducing step-by-step the plasticity of the cellulose. Figure 1 shows fabric (1) entering housing (2) over roller (4). It is impregnated in tank (3) with caustic, stretched and rinsed with water coming from the spraying device (59), and calendered by rollers (14). Further issuing between each calendering step is accomplished by spray heads (61).

Among the references cited by the Patent Office:

U S P 1,757,755 (Du Pont/1930): gelatinizing cellulose by a treatment with a 2-11% of caustic solution at the solution's freezing point or up to 20° C higher.

U S P 1,751,089 (Nashua Mfg Co/1930): applying a wool finish to cotton by mercerizing without tension, removing part of the caustic by rinsing, drying and finally removing the remaining caustic.

U S P 1,747,755 (Cromwell/1930) discusses a textile-treating machine containing rows of driven rollers which carry the goods through it in zig-zag fashion.

Brit P 516,843 (Rotta, Quehl/1940): obtaining water-resistant effects by impregnating fabrics with a diluted (salt-like, basic or acidic) solution, squeezing thereupon through pad rollers and drying.

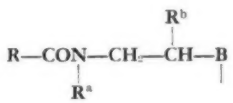
DYEING VAT DYES—— Adding Surface-Active Amino-Amide Salts C, 4, 02

Brit P 692,942
(Lankro Chem——Pugh——June 17, 1953)

Nonionic surface-active agents as well as cationic agents, e g, tetraalkylammonium halides and dodecylpyridinium sulfate, have been advocated for level dyeing with vat dyestuffs.

It has been found that certain surface-active amino-amide salts of cation-active character give even better results in this respect. They have to be used in smaller amounts than the nonionic agents in order to avoid precipitation of the leucovats. It has been noted further that the addition of nonionic high-molecular auxiliaries to the aforementioned amino-amide salts eliminates or at least decreases precipitation; thus the addition of protective colloids, such as fatty alcohol-ethylene oxide condensates, or glue, gelatine or the like, appears to be advisable.

The cation-active portion, i e, the amino-amide salts used in this case, are characterized by the formula



wherein R is a higher alkyl group, R^a and R^b are H- or alkyl groups, and B is a nitrogenous base or ammonia. Oleyl aminoethyl pyridinium chloride serves as an example. Condensates of cetylalchohol or oleylalcohol with ethylene oxide serve as examples of the nonionic components.

Examples in the specification call for adding compositions of this type to vats of Caledone Jade Green X or Caledon Brilliant Purple 2R. The leveling effect may be proved by dyeing viscose hanks in the same bath for 2, 5, 10 and 15 minutes. A gradual buildup of shade correlated to the dyeing time may be observed.

The cation-active products used in this case were prepared according to the co-pending Brit P 688,048.

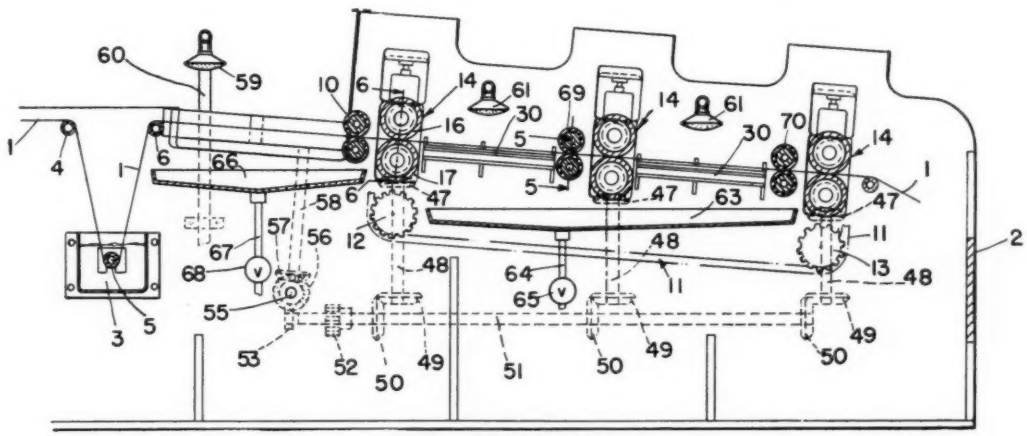


Fig 1—USP 2,646,341

Book Reviews

CHEMICAL PROCESS MACHINERY, 2nd Edition

E Raymond Riegel
Reinhold Publishing Corp
330 West 42nd Street
New York 36, N Y
vii + 735 pp
$12.50; 1953

This book is an enlarged edition of the earlier "Chemical Machinery". Much information of great value to the textile industry is covered in this excellent text. Almost every chapter has something of significance to the textile process; for example, Chapter 6 covers "Devices for Propelling and Elevating Liquids: Pumps, Blowcases, Ejectors"; Chapter 11 covers "Mixing, Kneading, and Blending Equipment for Pastes and Solids"; Chapter 17 covers "Driers". New devices, such as multispheres and multicylinders, high-speed centrifugal separators are described and illustrated. Numerical examples are contained and are of decided value. Prices of equipment are included from which an idea of the cost of an installation may be formed. The style of the author is a clear one, and the layout of the book in photographs and diagrams is top-notch. —VL

TECHNIQUE OF ORGANIC CHEMISTRY, Volume VIII—Investigation of Rates and Mechanisms of Reactions

Edited by S L Friess and A Weisberger
Interscience Publishers, Inc
250 Fifth Avenue, New York 1, N Y
xxii + 760 pp
$12.50; 1953

The present volume in the series is, as one of the editors says, "concerned with the theoretical and experimental tools used to establish the mechanisms of reaction." The treatment is a mixed one of theory and practice and should prove of value to the student and worker.

The book consists of ten chapters each written by an expert or group of experts. The book begins with The General Theory of Rate Processes, which is followed by Fundamental Operations and Measurements in Obtaining Rate Data, Special Experimental Methods for Determining Rate Data, and Evaluation and Interpretation of Rate Data, and then takes up the more practical application after the initial four chapters.

A lengthy chapter (VIII) on Polymerization and Polymer Reactions is of extreme interest, and one that could be studied with profit by the textile chemist. The style of the writer is somewhat of a handicap toward a more complete understanding. This reviewer on two pages counted eight sentences out of eighteen beginning with this or these! Confusion also arose at one point as the writer states on p 459 . . . "viscosities may be sufficiently high to exert deceleration of the condensation in the ultimate stages of reaction"; however on p 461 it is stated that "it has been found experimentally that no appreciable effect is exerted by the viscosity", and to secure this point is is emphasized that this is so even if the viscosity approaches infinity, i e, becomes a gel.

However, such critcisms do not detract to any extent from what is a thorough and comprehensive treatment of reaction rates.—VL

CHEMICAL METHODS IN INDUSTRIAL HYGIENE (Interscience Manual No. 3)

F H Goldman and M B Jacobs
Interscience Publishers, Inc
250 Fifth Avenue
New York 1, N Y
$3.75; 1953

Procedures for the quantitative determination of substances of importance in industrial hygiene along with a section on sampling comprise this book. Before each procedure are given methods for the preparation of the reagents used and methods for standardization of reagent solutions.

The procedures selected by the authors are those which can be performed in the laboratory without recourse to expensive equipment. In the appendix there is an outline for the sampling and analytical procedures in air analysis plus an index for each detailed procedure.

This book would be of value to a person whose field or interest is industrial hygiene. It is of little direct value to the textile chemist.—HB

REPORTS ON THE PROGRESS OF APPLIED CHEMISTRY, Volume 37 (1952)

Society of Chemical Industry (London)
Interscience Publishers, Inc
250 Fifth Avenue
New York 1, N Y
$6.50

The reports are written by various authors in specialized fields with the intent of showing progress made approximately over the year 1952. The articles are qualitative rather than quantitative in form, leaving it up to the reader to utilize the list of references at the conclusion of each article to obtain information which may be pertinent.

The reports are divided into seven sections: (1) Chemical Engineering and Water (2) Fuel and Fuel Products (3) Food and Agriculture (4) Inorganic Chemistry (5) Organic Chemistry (6) Biological Products and (7) Textiles, Plastics, Adhesives and Paints. In all, there are forty-two articles by different authors.

For those interested in textiles, there is a full section as well as articles in other sections dealing with sewage and trade wastes, water treatment, starch, general microbiological processes, intermediates and dyestuffs, and laundry chemicals.

The textile section is subdivided into cellulose textile chemistry and noncellulose textile chemistry. These subsections deal with the progress in these fields over a number of years rather than just over the year 1952. The author disagrees with some of the concepts now generally held, such as those concerning the hydrolytic degradation of cellulose, and the oxidation of cellulose by hypochlorous acid.

This report is worth while for a person interested in the recent developments covered by these topics. It serves as a form of discussive bibliography of recent progress in applied chemistry.—HB

FIBER MICROSCOPY (Interscience Manual No. 2)

A N J Heyn
Interscience Publishers, Inc
250 Fifth Avenue
New York 1, N Y
407 pages
$5.50; January, 1954

This is another of the Interscience Manuals directed primarily at the laboratory technician. Apparently little or no proofreading was done since misprints and type misplacements are numerous; the author's English could have been improved also.

In spite of these faults it is a pleasant little book, not profound but sufficient for routine work. The author interspaces discussion of the microscope and its accessories between discussion of the textile fibers, which is excellent for teaching purposes but rather irritating for reference; it also causes frequent repetition. The book fills a void between volumes aimed at research and those of a popular nature.—JHS

Proceedings of the
American Association of Textile Chemists and Colorists

Copyright, 1953, American Association of Textile Chemists and Colorists
Editor of Proceedings: Carl Z Draves, 30 Lahey St, New Hyde Park, N Y

APRIL 12, 1954

"The South's First Textile Wet-Processing Exhibit"——

"1954 Convention Message to AATCC Members and Friends"

C Russell Gill
General Chairman

Paul G Wear
Assistant Chairman

THE sponsoring Southern Region will be your host at the 33rd National Convention this September 15-18 at Atlanta, Georgia. The main theme of this four-day meeting will be "The South's First Textile Wet Processing Exhibit." The response from previous exhibitors and supply and service companies among our Corporate Members has already assured filling the 100-booth Exhibition Hall at the headquarters Atlanta Biltmore.

The technical, business, exhibits, and social programs are planned to take full advantage of our favorable geographical location near the center of the textile manufacturing and processing industries by appealing to mill men's attendance at both management and operation levels. What you see and hear at Atlanta will be new, interesting, and stimulating, and we Southern members accept the challenge of maintaining the Region's reputation for hospitality.

It is not too early to ask your indulgence and co-operation in our housing problem at Atlanta. There will be satisfactory accommodations for all, but an equitable allocation of rooms at ten hotels makes it necessary that we adhere to Association policy of processing room reservations with advance Convention registrations. Advance registration, reservation, and information forms will reach the membership in July, and we ask that you wait until registering to request confirmation of room assignments in Atlanta hotels.

We plan on making this year's 33rd National Convention one that you cannot afford to miss, and we look forward to welcoming you to Atlanta.

C RUSSELL GILL, PAUL G WEAR

*AATCC Research Newsletter No. 10

NEWS IN GENERAL

Plans are rapidly shaping up for the next quarterly meetings of the Council and research groups to be held in Atlantic City on April 29-30 at the Hotel Dennis. The ten research committees that have scheduled meetings for the 29th are being aided by AATCC's staff at Lowell in the preparation of material to be presented at that time. A schedule of these meetings and agenda was recently mailed to the Technical Committee on Research.

Details of an all-day Symposium on May 19 will be announced shortly. Better keep this date open for one of the year's outstanding events. Its theme — AATCC Research -- The Yardstick for Progress. A display of AATCC's new rapid control tests will be one of the feature attractions.

Manuscripts of Parts I, II, III, and IV of the 1954 TECHNICAL MANUAL AND YEAR BOOK have been turned over to the printer. Checking galley proofs will be the next tussle with this annual production chore. The new manual will feature a small but useful addition — a listing of changes in test methods from the previous edition.

Testfabrics Inc is now offering its AATCC-approved multifiber tear cloth in precut, edge-sealed form. Sizes — 2x2 and 2x4 inches in packs of 500.

AT RESEARCH HEADQUARTERS

A Certificate of Registration has been issued to AATCC by the U S Patent office covering the trade mark "Accelerotor." A patent for the device has been applied for.

Two uses for the Accelerotor will be checked shortly by inter-laboratory tests to be carried out under the direction of the committees on abrasion and washfastness. Research associate H Glidden is handling the preparations for this work.

A central filing department has been set up for storage of Intersectional Contest Papers, data and correspondence. The arrangement and indexing of this material will be made to best serve the research purposes of AATCC.

Technical manager E P Johnstone has just completed a condensation of the extensive report on shrinkage in laundering recently submitted by the Committee on Dimensional Change. The condensed form of the report will appear in the next Corporate Membership Bulletin and subsequently in the AMERICAN DYESTUFF REPORTER.

COMMITTEE ACTIVITIES

The Technical Committee on Research has voted two new test procedures as Tentative Test Methods -- Electrical Resistivity of Fabrics and Rapid Control Test for Gas Fading. Copies are available from research headquarters.

Chas A Sylvester of E I du Pont de Nemours & Co, Inc was recently appointed a member of the Executive Committee on Research.

William F Brommelsiek, Forstmann Woolen Co, Norman B Gobeil, J P Stevens Co and L G Blomquist, Interchemical Corp have been appointed to the Committee on Drycleaning Test Methods.

John K Sumner of the Masslinn Division of Chicopee Mfg Corp has been appointed Chairman of the Joint Committee with ASTM on nonwoven fabrics.

D G David, Alexander Smith Inc has been named Chairman of the Committee on Continuous Wool Scouring.

James R Redmond, Interchemical Corp is now Secretary of the Committee on Evaluation of Fire-Resistant Textiles.

Jack J Press, Naval Supply Activities, New York, has been appointed to the Committee on Resistance to Abrasion.

Robert P S Black of E I du Pont de Nemours & Co, Inc has become a member of the Committee on Bleaching.

* Published every other issue of the AMERICAN DYESTUFF REPORTER.

AATCC CALENDAR

COUNCIL
1954—Apr 30 (Atlantic City), June 15, Sept 15, Nov 19.
1955—Jan 21, Apr 15, June 17

NATIONAL CONVENTIONS
Sept 15-18, 1954 (Atlanta Biltmore, Atlanta, Ga); Sept 21-23, 1955 (Chalfonte-Haddon Hall, Atlantic City, N J; 1956 (New York); 1957 (Boston).

HUDSON-MOHAWK SECTION
May 14 (Albany); June 18 (Outing).

MID-WEST SECTION
June 11-13 (Annual Outing—Lake Lawn Lodge, Delavan, Wis).

NEW YORK SECTION
May 14 (Swiss Chalet); June 18 (Outing, North Jersey Country Club, Wayne, N J).

NORTHERN NEW ENGLAND SECTION
June 11 (Outing—Merrimack Valley C C, Methuen, Mass); Oct 8 (Colonial C C, Lynnfield, Mass); Dec 10 (Woodland Golf Club, Auburndale, Mass).

PIEDMONT SECTION
June 11-12 (Outing Mayview Manor, Blowing Rock, N C); Oct 16 (Hotel Barringer, Charlotte, N C).

PHILADELPHIA SECTION
May 21 (Outing—Manufacturers Golf & Country Club, Oreland, Pa); Sept 24, Oct 29 (Penn-Sherwood Hotel, Philadelphia, Pa); Dec 3 (Kugler's Restaurant, Philadelphia)

RHODE ISLAND SECTION
Apr 29 (Wannamoisett Country Club, Rumford, R I); June 11 (Outing—Wannamoisett C C); Oct 14 (Johnson's); Dec 2 (Annual Meeting—Sheraton Biltmore, Providence, R I).

SOUTH CENTRAL SECTION
April 24 (Hotel Patten, Chattanooga, Tenn); June 4-5 (Summer Outing—Chattanooga Golf and Country Club); Dec 4 (Hotel Patten, Chattanooga).

SOUTHEASTERN SECTION
May 14-15 (Outing—Radium Springs, Ga); Dec 11 (Atlanta-Biltmore, Atlanta, Ga).

WESTERN NEW ENGLAND SECTION
May 14 (Ladies Night—Waverly Inn, Cheshire, Conn); June 18 (Outing—Chase Country Club, Waterbury, Conn); Oct 1, Nov 12, Dec 10 (Rapp's).

EMPLOYMENT REGISTER

This column is open for two insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers who can obtain further information from the Secretary.

54-4
Education: B S, textile chemistry & dyeing.
Experience: Supervision in production of synthetic fibers.
Age: 31, married; veteran; references; South preferred.
3-29, 4-12

54-5
Education: Textile chemistry & dyeing.
Experience: Textile chemist & dyer.
Age: 37; married; veteran; references; northeastern US preferred.
3-29, 4-12

54-6
Education: textile school, Germany.
Experience: 30 years as dyer and superintendent in U S and Canada; all types of hosiery.
Age: 57; married; references; position as head dyer desired, location not restricted.
4-12, 4-26

MEMBERSHIP APPLICATIONS

March 26, 1954

SENIOR

Charles R Barnes, Jr — Process development engineer, F C Huyck & Sons, Rensselaer, N Y. Sponsors: H S Dahlberg, R H Beaumont, Jr.

Robert E Brouillard — Area supervisor, General Aniline & Film Corp, Linden, N J. Sponsors: M O Shrader, W K Fricke.

William N Dulaney—Southern manager, A E Staley Mfg Co, Atlanta, Ga. Sponsor: G R Gill.

Kenneth D Houser — Specialist-customer service-dyeing & finishing, E I duPont de Nemours & Co, Inc, Wilmington, Del. Sponsors: G M Richardson, B F Faris.

John W Ertel—Chemist, Cincinnati Chemical Works, Inc, Cincinnati, O. Sponsors: T Heginbotham, O Hagist.

Walter L Marple—Applied science instructor, Nat Inst of Drycleaning, Silver Spring, Md. Sponsors: R T Graham, E R Clark.

Salvatore N Salemi—Overseer, bleaching & finishing, Monument Mills Inc, Housatonic, Mass. Sponsors: W J Kapinos, H Gendreau.

Luis Solana—Consultant chemist, Banco Urquijo - Estudios Quimicos, Madrid, Spain.

Enzo fu Luigi Steffanoni—Dyehouse manager, Linificio e Canapificio Nazionale, Bergamo, Italy.

Robert F Wenck, Jr—Supt of dyeing & finishing, Burlington Mills, Morelos, Mexico. Sponsors: C Hooper, J B Neely.

Mary C Whitlock — Head, Textile & Clothing Dept, University of R I, Kingston, R I. Sponsors: W G Parks, E J Chornyei.

Edwin M Williams, Jr—Technical Dept, Nat'l Aniline Div, Allied Chem & Dye Corp, Atlanta, Ga. Sponsors: J K Boykin, T M Ferguson.

Charles J Wills—Research chemist, F C Huyck & Sons, Rensselaer, N Y. Sponsors: H S Dahlberg, R H Beaumont, Jr.

William Wygand, Jr—Demonstrator, E I duPont de Nemours & Co, Inc, Technical Laboratory, Wilmington, Del. Sponsors: R J Thomas, M G Dimon.

JUNIOR

Donald R Christie—Research chemist, F C Huyck & Sons, Rensselaer, N Y. Sponsors: H Dahlberg, R H Beaumont, Jr.

Andrew W Dykers, Jr—Training sales & demonstration, Marler Chem Co, Cleveland, Tenn. Sponsors: T J Marler, W T Evans.

James W Lederer — District sales mgr, Richmond Oil, Soap & Chem Co, Philadelphia, Pa. Sponsors: W Alkus, M W Levi.

John G Signorino—Lab tech, American Aniline Products Inc, Hawthorne, N J. Sponsors: G Heine, H P Baumann.

ASSOCIATE

Mario L Ottolenghi—Chemical engineer, vice-pres, Chemore Corp, New York, N Y.

Charlotte M Womble—Textile & clothing instructor, Flora MacDonald College, Red Springs, N C.

George J Zeagas—Salesman, Van Waters & Rogers, Inc, Portland, Ore.

STUDENTS

Susan M Mueller — Purdue University. Sponsor: R Padgett.

Gordon A Berkstresser, III—North Carolina State College. Sponsor: H A Rutherford.

CORPORATE

Wica Chemicals, Inc

APPLICATION FOR TRANSFER TO SENIOR MEMBERSHIP

Joseph F Beck
Walter E Flister
Arthur Schiff
William M Segall
Francis S Webster, Jr

Rhode Island, Piedmont and Southeastern Sections——

THE BOND MACHINE*

BOYCE C BOND

Fine Chemicals Division, Pittsburgh Coke & Chemical Company

The inventor of the Bond Machine explains how his new device for textile wet processing brings fabrics into such quick and forceful contact with dye or other liquors that equilibrium is very quickly attained between fiber and liquid medium to give uniform results at high production rates. Briefly, the machine permits passage of goods horizontally in open width between parallel perforated plates, through which liquor flows by way of systematically placed holes perpendicularly toward both faces of the cloth and then laterally back toward a pump without contact of cloth with the plates. The volume of liquor in the machine is very short and is maintained by gravity feed with automatic float controls.

Many uses of continuous ranges constructed with several units in tandem are suggested for carrying out different dyeing and other procedures on fabrics of various fibers and constructions. Machines to process goods at widths of 50 and 60 inches are under construction.

INTRODUCTION

THE Bond Machine has been licensed for building and distribution by Hussong-Walker-Davis Co, Coral & Valetta Sts, Philadelphia 24, sponsored by Pittsburgh Coke & Chemical Co, Pittsburgh 17, Pa (see Figure 1). The 14" pilot machine composed of four units in the range is incidentally the fourth experimental Bond Machine constructed to date. This 14" pilot machine has been thoroughly tried out on all classes of dyes, chemicals and fabrics.

We are now constructing a continuous range with type 316 stainless steel. This machine will be equipped with pneumatic air pressure controls for raising and lowering the squeeze rolls and upper pressure units. Threading ease is made possible by this unique automatic pressure control for the raising and lowering of the upper pressure units to which the Bond Machine is especially adapted. By flicking a button, the upper pressure units can be raised instantly from the bath, if the fabric should break or tear during the run. In like manner, another button may be pushed to lower the upper pressure unit instantly into its original position for continuous operation.

Automatic temperature-recording controls will be installed on this range. The dye and feed compartments will be steam jacketed for maintaining uniform temperatures without change in liquor volume.

The special pumps will be constructed to deliver 800 gallons per minute at constant flow and pressure. The pumps will have their individual 15-HP, direct, splashproof, motor drives, independent of the range drive.

This range will be equipped with practical tension controls. The device used to govern the tension is an automatic electronic device developed and supplied by General Electric Company to provide as low as plus-or-minus-one tension, or as much tension as desired.

Special dual filters will be incorporated on the first unit of this range for keeping the lint or other extraneous matter from the processing liquors. One filter remains in use at all times, while the other may be easily cleaned during continuous operation. These filters are operated by manual lever shift periodically, ie, hourly. This shift can be made automatic. Some fabrics will possibly run an entire day without the cleaning of filter baskets, while for other fabrics with a high content of lint and extraneous matter, more frequent cleaning of the filters will be required. However, inexpensive spare baskets may be kept available, thus allowing cleaning to be done at leisure on a wholesale basis. The other units will be equipped with single type filters.

The pressure-head units will be specially baffled according to patent, and the pumps will circulate the dye or chemical liquor into the manifold, off which leads will enter into the upper and lower pressure-head units simultaneously. Perforated plates, calculated in precise pattern, are attached to the pressure-head units and allow the flow onto the fabric, which passes in open width between these two special plates. Uniformity of dyeing and speed of application of dyestuff are the two important features of the Bond Machine resulting from the passage of fabric in open width between the perforated metal plates. Variable-speed controls will permit variation of the speed of fabric in the machine from 20 to 120 yards per minute.

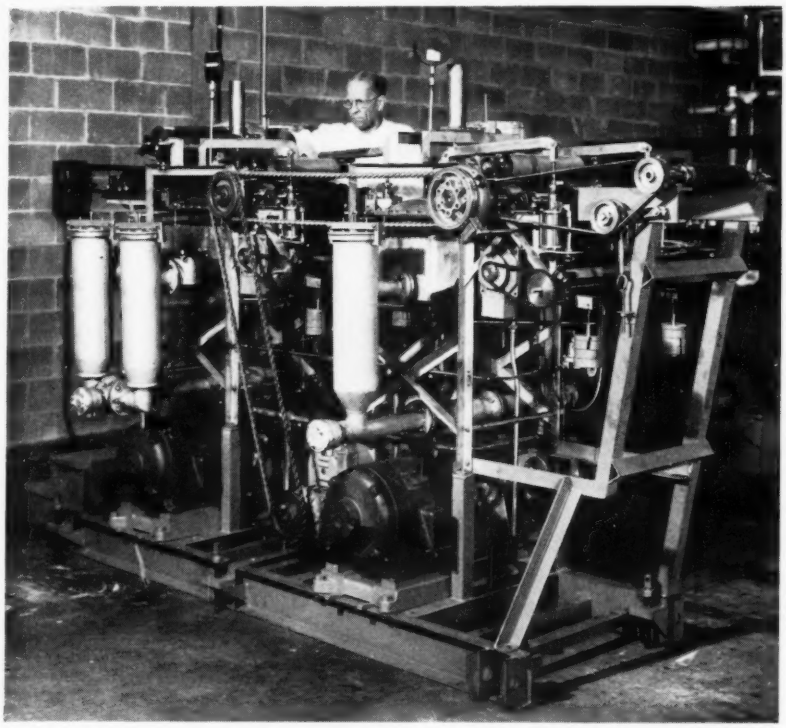
The Bond Machine operates on a very low volume ratio; for instance, in a 60-inch face machine, the volume will be approximately 50 gallons or less. Only two men are required to operate a commercially sized range continuously. Five or six units constitute a range suitable for applying vat, naphthol and sulfur dyestuffs. Three units are satisfactory for applying soluble vats (leucoesters), directs or disperse (acetate) dyes, where no aftertreatment is required — the disperse dyes being applicable on either acetate or nylon. The Bond Machine is extremely compact; a 60-inch face, 5-unit range will occupy a floor space of approximately 8 x 40 feet, which is about one-third the floor space of comparable continuous machines now in common use.

GENERAL PRINCIPLES OF BOND MACHINE

The Bond Machine is extremely versatile in use, as well as in the application of various dyes and chemicals to different kinds of fabrics. Flexibility is another added advantage of this machine, being suitable for short runs, even as low as 50 yards, with better and speedier diffusion of dye or chemical solutions throughout the fabric.

LIQUID PRESSURE———Liquid pressure rather than mechanical pressure is used in the Bond Machine. This is extremely advantageous in the handling of delicate or pile fabrics. The dye or chemical liquor is supplied to the dye or chemical feed compartment with automatic flow control, the units for which are above the pressure plates. The automatic liquor-level flow controls are attached on the bottom of the feed or reduction compartment connected directly to the pump lines. The discharge liquor that overflows from the pressure units into the dye or chemical compartments is again taken into the pump lines and delivered along with fresh added dye or chemical solution from the automatic-

* Presented before the Rhode Island Section on February 27, 1953, before the Piedmont Section on April 11, 1953, and before the Southeastern Section on September 5, 1953. Submitted to the Reporter by the Editor of Proceedings on January 15, 1954.



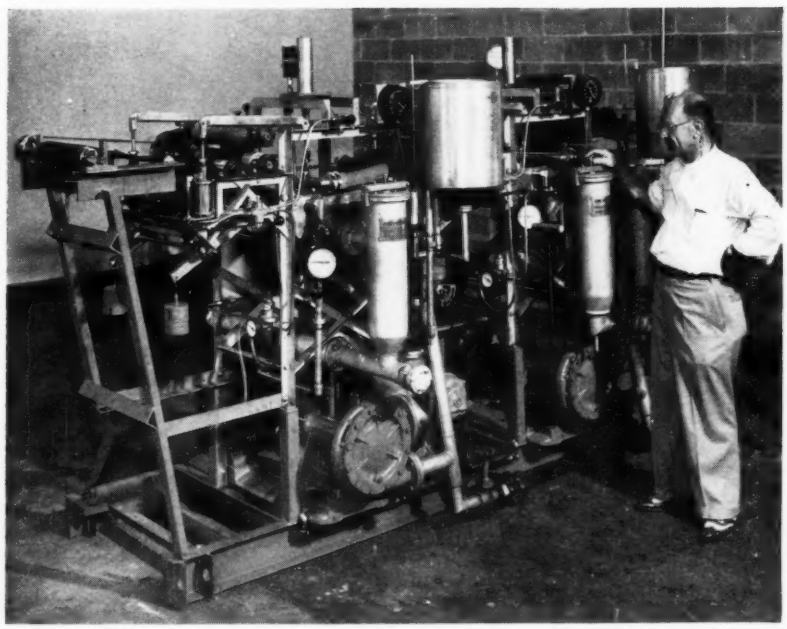


Figure 1
Two views of the Experimental Bond Dyeing Machine

feed-control line, thus insuring uniformity from side to side of the fabric and from the start to the finish of the run.

Travel of the material (see Figure 2) is horizontal between the plates. The dye or chemical liquors are forced vertically through the plates onto the material traveling at a given speed at right angles to the travel of said material, while ejection or withdrawal of spent dye or chemical liquor into the pump lines from each side of dye or chemical compartment is again at right angles to the travel of material horizontally and also at right angles to the injection of fresh dye or chemical liquor simultaneously mixed with the spent dye or chemical liquor in the pump lines. A third plane or dimension is therefore established with reference to the travel of the material in relation to the movement of dye or chemical liquors being injected and ejected.

The processing liquor is forced by a special circulating pump into special baffled pressure head-units onto which the special perforated plates are attached; hence, it passes through the baffled head and plates into the material with equalized pressure on both face and back of the fabric. This equal pressure varies from 1 to 5 lbs measured on the face and back of the fabric at the discharge side of the plates. The pressure-head unit design produces continuous sheets of solution with every uniform distribution, which meet within the fabric, thus excluding all air as the material passes through in open width. The plates must be submerged at all times while in operation in order to obtain these conditions. The vent on each side of the plates is equal to the distance between the plates as adjusted according to the fabric being processed. The adjustment between the plates is figured for an allowance of 1/16 inch on each side of the fabric. The distance between the pressure plates may be adjusted quickly to adapt this machine for dyeing carpeting or any high-pile fabrics or very thin or frail fabrics. The majority of fabrics do not require any change of adjustment; for instance, cotton corduroy may be dyed with the same spacing as that used for flat 8.2-oz Army twill, 9-oz sateen, 4-yard lawn, poplin, etc. These fabrics are processed with 3/16-inch clearance between the plates. For heavy rugs, the clearance would be increased to approximately ½ inch between the plates. There is no danger of the fabrics touching either plate because of the equalized pressure exerted on both face and back causing the fabric to float in a center-line position. The finest of satins can be run without scratching or marring the fabric. Tension controls with minimum squeeze-roll pressure make possible its use in processing the most delicate fabrics. The squeeze-roll pressure is governed by pneumatic pressure controls and may be adjusted from zero to 100 lb per square inch linear pressure as desired, but very seldom is it necessary to go beyond 50 lb, most fabrics operating being processed at a linear pressure of 20 to 40 lb per square inch. The design in the head unit, plates, special constant-flow pumps, filters and the short exposure time of the material to dyestuff or chemical liquor, plus the third dimension or plane application of the dye or chemical liquor in relation to the material passing through are keys to the Bond Machine's success.

The unusually low volume of dye or chemical liquor employed in the Bond

Machine effects substantial savings in dyes and chemicals.

FABRICS ——— Dacron, Orlon, and Fortisan have all been dyed with vat colors by the reduced flash method continuously at 190°F in light to medium depths of shade. This machine seems especially adapted to this kind of use. Dacron has also been dyed successfully on a continuous basis with the later fast acetate "GLF" type of colors by carrier methods at 190°F. Other fabrics dyed successfully on this machine include cotton, rayon, acetate, high-tenacity rayon, high-tenacity acetate, nylon and wool. Pile fabrics, such as corduroy, velvet, plush, mohair, carpeting and noncrush rayon and silk evening-gown velvet, have been dyed on the Bond Machine with a minimum of crushing or distortion of the pile. Carpeting and mohair upholstery fabrics with rubber-coated backs have been successfully dyed on this machine.

We have also dyed all-wool felt composed of five different grades of wool in the blend at 20 yards per minute with a combination of fast-to-light acid colors as well as cotton-wool felt with a combination of direct and neutral-dyeing wool colors. Blends of various fibers (as many as 5 or 6 different types) have been dyed successfully on this machine with vat and other color combinations by the continuous method.

Blends that contain 20 to 30% wool along with cotton and rayon have been successfully dyed with vat colors by the continuous method without any deterioration of the wool fiber. Blends of acetate, cotton and viscose containing as high as 25% of acetate in the blend have been dyed in light to medium shades with vat colors continuously without any deacetatization of the acetate fiber. All types of cotton tapes and hat ribbons as well as rubberized tapes, acetate ribbons, rayon and nylon ribbons and laces have been dyed in multiple strands on this machine at 70 yards per minute. It is to be noted that the rubber is not deteriorated when dyeing on this machine because of its short exposure to the dye or chemical liquors. We have dyed nylon knitted tubular fabrics with the later fast acetate "GLF" colors successfully. We have dyed cotton as well as rayon tubular knit goods in tube form continuously on this machine without a dye line or crease mark showing on the finished fabric.

SPEEDS ——— As stated above, the Bond Machine may be operated at variable speeds from 20 to 120 yards per minute. The length of time the fabric is exposed to the dye or chemical liquor will vary with the speed of the fabric through the machine as follows:

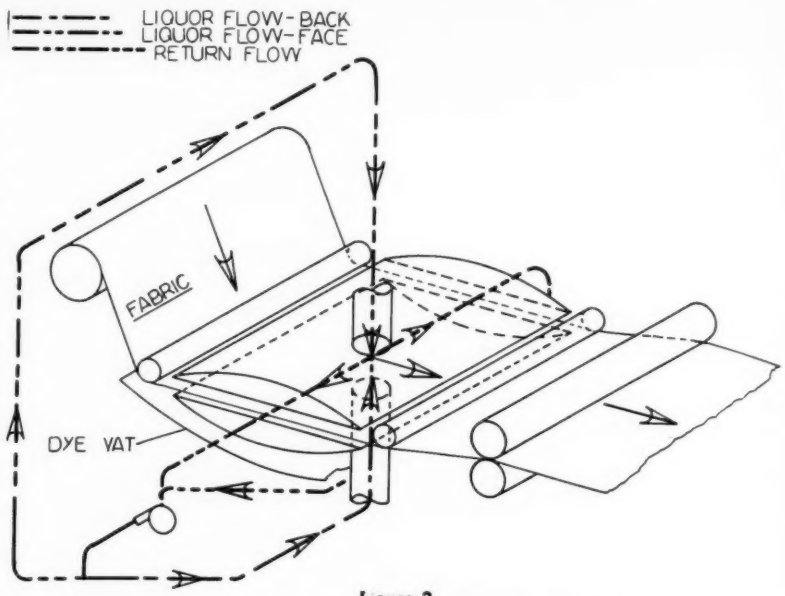


Figure 2
Direction of Goods and of Liquor Flow in Bond Machine

Fabric speed	*Maximum exposure to machine liquor*
yards per minute	*seconds*
20	2.91
70	0.83
80	0.73
90	0.65
100	0.58
120	0.48

CLASSES OF DYES OR CHEMICALS ———The Bond Machine is suitable for the application of all classes of dyes including disperse (acetate) dyes, acids, vats, soluble-type vats (vat esters), directs, sulfurs, naphthols, diazos, pigments, etc. An outstanding feature is that one may mix dyes in this machine without regard to exhausting rates, affinities, variations of affinity with temperature or solubilities and still obtain uniform results. One may ask, "Is it not possible that in color mixtures one color would exhaust faster than the other, thereby changing the shade intended?" On the basis of work to date with colors of varying exhaustion rates, affinities and solubility ratios, this has been proven not to be the case. We have purposely tried runs with combinations containing as high as six fast-to-light direct cotton colors with wide-spread dye ratings, which are very difficult to dye level. These were applied to a roll made up of 8.2-oz Army twill, which was scoured in one mill continuously, sewed together with another roll of 9-oz sateen as scoured in another mill, and sewn together again with bleached corduroy as bleached in a third mill. As you will note from the sample here, the shade, penetration and uniformity are all commercially passable. This we do not find can be accomplished with any degree of success on the conventional types of machines today.

The reasons for this phenomenon are the following:

1) One color does not exhaust or dye heavier or lighter because, in the Bond Machine even at slow speeds of 20 yards per minute, the fabric is exposed to the dye or chemical liquor for so short a time under constant pressure, and because the high rate of liquor flow in the third plane with relation to the fabric does not permit the dyeing to vary according to dye ratings as it does in other machines without these conditions.

2) The dyeing is done near the theoretical flash point," and particles or molecules of dye or chemicals are driven, bombarded or exploded into the fabric almost instantaneously in direct proportion to their mixed content by this high rate of flow under constant liquid pressure exclusive of air. Therefore, with the speed of the machine and extremely short exposure of liquor and fabric, and with the most efficient distribution of the dye or chemical liquor onto the fabric, there is no time for variation. One writer has termed dyeing in the Bond Machine "The Shot Gun Technique." Especially with vat colors one may mix cold-dyeing with hot-dyeing types with good results. One may also successfully mix low-substantivity nephthols with high-substantivity naphthols.

EXAMPLES OF USE

VAT COLOR APPLICATION ——— The line drawing of Figure 3 illustrates a 5-unit continuous range suitable for vat-color dyeing; 6 units would be better.

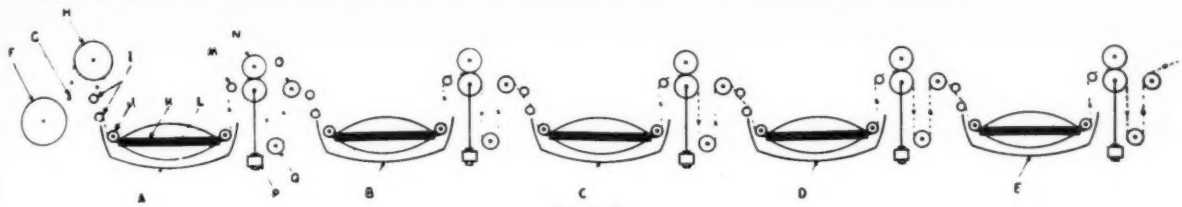


Figure 3

Bond Machine Operated as a 5-Unit Continuous Range for Vat Dyeing

A. Dyeing Machine
B. Cold Chemical Machine
C. Rinse Machine
D. Soaping-Off Machine
E. Rinse Machine
F. Gray Goods Supply
G. Fabric
H. Feed Roll
I. Spreader Bar
J. Guide Roll
K. Upper Injection Plate
L. Lower Injection Plate
M. Spreader Bar
N. Nip Rolls
O. Idler Roll
P. Range Drive Motor
Q. Compensating Gate

Vat colors may be applied by the pigment method on the Bond Machine with or without drying before reduction but are best applied by the reduced flash method as follows:

The vat-color pigment along with the required amount of caustic soda plus a good penetrant is made up in a storage makeup tank on the platform cold or at room temperature. The hydrosulfite is made up in another tank on the platform cold or at room temperature. The quantities of caustic soda and hydrosufite vary from 4 to 6 oz per gallon for each, depending on the depth of shade.

UNIT #1 Both the cold pigment-color dispersion and the cold hydrosulfite solution are allowed to flow by gravity or proportionate pump feed into the automatic-feed or reduction compartment, attached to the Bond Machine, the flow being adjusted so that equal parts of color and hydrosulfite solutions are supplied. The color is instantly reduced and fed to the dye compartment by way of the pump lines and onto the fabric as it passes between the plates in open width. The feed is adjusted to maintain the original level at all times in the dye or chemical compartment and is controlled through the entire run with the automatic level controls in the feed compartment. These controls can be adjusted for more or less liquor flow as needed. It is only necessary to have enough color and hydrosulfite solution to cover the conical-base portion of the feed compartment, which at all times would be approximately 1 gallon total. Thus, there is no long time of reduction of vat colors before they are taken up by the cloth as it travels between the plates. Vat Blues, such as the BF or BCS types, are best reduced and dyed at 140 to 160°F. All the other vat colors tried so far have been found to dye successfully when reduced and dyed by this flash method at 190°F.

UNIT #2 This unit contains running water in the dyeing of Vat Blue BF or BCS types. In dyeing other vat colors, one may use this unit for oxidizing chemicals, namely, acetic acid and hydrogen peroxide. These are fed in the same manner as color is fed into Unit #1. The quantity of acetic acid should be kept 10% in excess of the quantity of caustic soda used in Unit #1 for reduction.

UNIT #3 In dyeing Vat Blue BF or BCS types, this unit would be used for oxidation. In dyeing other types of vat colors, it would be used for hot-water rinsing.

UNIT #4 This unit would be used for soaping at 190 to 200°F.

UNIT #5 This unit would be used for warm-water rinsing.

All of the units will be equipped for regulating overflow when and if necessary in continuous runs.

Assuming the range is operated at 70 yards per minute, we should then be dyeing the fabric with vat colors in 0.83 seconds. Complete oxidation or fixation of this vat color would also take place in 0.83 seconds in Unit #2 or Unit #3. This we believe to be the fastest known dyeing and fixation of vat colors.

NAPHTHOL-COLOR APPLICATION———UNIT #1 Contains the naphtholating liquor fed as described in the vat-color process at 190°F.

UNIT #2 Cold salt-water rinse (3 to 4 oz salt per gal) overflowing.

UNIT #3 Contains Fast Color Salt or Base solution fed as described in vat-color process.

UNIT #4 Running hot-water.

UNIT #5 Aftertreatment with sequestering agent plus nonionic detergent made alkaline with soda ash. This aftertreatment solution is fed as described for the vat-color process. This solution should be applied at 190 to 200°F.

UNIT #6 Hot-water rinse.

Assuming the range is operated at 70 yards per minute in dyeing naphthols, naphtholation would take place in 0.83 seconds, and likewise the coupling would take place in 0.83 seconds. We believe this is the shortest time in which the naphtholation and coupling of naphthols has been successfully accomplished.

The scouring, bleaching and general preparation of fabrics have also been successfully conducted continuously on the Bond Machine. Various types of aftertreatments, such as waterproofing, mildewproofing, mothproofing, and coating, may be applied continuously on this machine, and likewise finishes may be applied continuously, such as softeners and resins. It has also been suggested that this machine be used as an impregnating unit in mercerizing and as a saturator in continuous bleaching.

All formulas are made on the volumetric basis for the Bond Machine. Other possibilities are the dyeing and treatment of worsted, paper, etc. With simple mechanical modification, we believe this machine would be excellent for the dyeing of warps, yarns and both wool or cotton raw stock by the continuous method.

OTHER USES———Should one wish to attain temperatures of 250 to 300°F, one unit could be enclosed and pressurized to dye acrylic and polyester fabrics without the use of carriers or assistants, which would also be suitable for worsted and woolen fabrics. Drawings and calculations have already been completed for such a machine. However, this would mean dyeing fixed yardages because of the enclosures necessary. Methods are being considered to make the Bond Machine suitable for dyeing these newer synthetics continuously at high temperatures.

We are all familiar with jig dyeing and realize its advantages and disadvantages. In dyeing goods on a jig, there may be losses from endedness, seam marks even into the second and third piece of the roll, mark-off in patching for sample work, and there is always ever present the danger of listedness or shadiness from side to center, or shadiness from side to side. All of these troubles are eliminated on the Bond Machine, and the entire goods up to the seam of each piece in a roll may be of first quality. This represents a vast savings over a period of time. It is the writer's opinion that the jig is fast going out, especially in the up-to-date or modernly equipped dyeing and finishing plant. A unit of the Bond Machine may be used as a jig by simply applying a feed roll and take-up roll for the goods. When material passes once through a unit of a Bond Machine at 70 yards per minute, a dyeing is obtained which is equal to one that has been made from 4 to 6 ends on a jig without any of the faults of jig dyeing.

With other known conventional types of continuous dyeing machines, it is generally considered that only runs of 15,000 to 25,000 yards of one shade are economical. This is not true for the Bond Continuous Machine, on which short yardages of various shades are profitable.

The cleaning of this machine may be accomplished very rapidly and efficiently as compared with other types of continuous machines because of the high rate of flow and pressure exerted by the pumps, which accelerate the efficiency of cleaning.

In conclusion, I wish to advise that there are two units of the Bond Machine incorporated in a 72-inch range for continuously developing, soaping and finishing screen prints with soluble vats (vat esters) and Rapidogens. As these units have been modified for this particular use, they cannot be used for dyeing. This machine has been running continually for about five years. It has successfully eliminated mark-offs and bleeding into whites to give clear-cut prints.

Hudson-Mohawk Section——

THE USE OF SUPERHEATED STEAM AS A DRYING MEDIUM*

JAMES H HUNTER

James Hunter Machine Company, North Adams, Mass

INTRODUCTION

THE use of steam as a drying medium rather than air is by no means a new development. It has been attempted many times before, and probably was used at least fifty years ago.

Originally, experiments were conducted which proved that, by raising steam pressure to a minimum of sixty pounds per square inch and preferably higher, it was easy to maintain a temperature in excess of 212°F within the enclosure of a dryer. In this way, advantage could be taken of the superheated vapor yielded by the cloth as a drying agent. It would not then be necessary to introduce fresh air into the enclosure, and therefore steam economy would be improved, with the added advantage of a higher enclosure temperature. With 100% recirculation, the moisture evaporated from the cloth passes through the heaters along with the air, and so is superheated to a higher temperature of 270°F or more. With a pressure of 100 pounds per square inch, which is available in practically every mill and finishing plant today, temperatures of 300°F or more are possible.

By using regular extended surface heaters and circulating the vapor through fans, the superheated vapor at temperatures used in drying today at atmospheric pressure has a heat transfer of approximately one and one-half times that of air for the same mass velocity. However, superheated vapor is much lighter than air, and an inherent characteristic of fans is that the volume delivered is little affected by the density of the gas, so that, for a given fan speed, the mass velocity with superheated vapor is lower than with air. This actually means that changing from an air drying to one using superheated vapor is of negligible advantage on heat-transfer potentiality, that is, under any given set of conditions, superheated water vapor is not necessarily more effective than dry air as a drying agent.

J H Hunter

When superheated steam is allowed to impinge at high speed closely and properly onto a wet fabric as in a Vapojet Tenter Dryer, certain favorable effects over hot air in drying are attained, according to the author, the most important of which are the following: a) superheated steam eliminates the migration of resins and dyes, b) it eliminates overdrying, c) it conditions the fabric, and d) it reduces the over-all costs of drying.

PRINCIPLES OF USE OF SUPERHEATED STEAM FOR DRYING

Before discussing the reasons for using superheated steam rather than air in the light of the above disclosure, a closer examination of exactly how a machine using superheated steam operates is necessary.

As cold wet cloth enters one of our Vapojet Tenter Dryers, its temperature rises rapidly to a value corresponding to the vapor pressure. This temperature remains nearly constant for the greater part of the cloth travel through the enclosure, and then rises rapidly at the leaving end with exhaustion of the moisture. The rate of drying is proportional to the temperature difference between the cloth and the gases impinging on it. The change from air to superheated vapor raises the vapor pressure within the enclosure and therefore the temperature of the cloth.

DRYING EFFICIENCY —— Drying efficiency is expressed as the ratio of the steam condensed in the heaters to the water evaporated from the cloth. This ratio does not have a specific value for any given machine, as is so often claimed. It can vary quite widely according to the conditions prevailing in the tests, the nature, state and width of the cloth. It follows that a value for the efficiency ratio determined under selected favorable conditions may not represent the results to be realized under normal operating conditions.

TOTAL HEAT FOR DRYING—— In addition to the heat required for the actual evaporation of the water from the fabric, steam consumption is required for the following items in a dryer using superheated vapor as a drying medium:

1) To raise the temperature of the cloth and its normal moisture regain from its entering to its leaving temperature.

2) To heat the liquid with which the cloth has been impregnated from its entering temperature to that at which it is vaporized.

3) To superheat the water vapor given off by the cloth to the temperature at which it is either recirculated or expelled from the machine.

4) To supply the difference between the latent heat of the high pressure steam in the heaters, and the higher value of the latent heat of vaporization from the fabric.

5) To supply the heat loss from the panels of the Vapojet Tenter Dryer itself, from the rails, clips, etc.

Items #1 to #4 represent the operation of natural laws over which the designer has no control. Under average running conditions, from 1.35 to 1.4 pounds of steam have to be condensed to evaporate one pound of water from the cloth, to meet these natural requirements, without taking into account the heat loss through the panels and supporting members of the dryer itself. It has been figured that, with modern glass wool insulation and with no "through" metal (metal extending from inside to outside), which is an exclusive feature of the Hunter Vapojet,

* Presented at Jack's Restaurant in Albany, N Y, on Friday, Oct 2, 1953. Manuscript presented to the Reporter by the Editor of Proceedings on November 24, 1953.

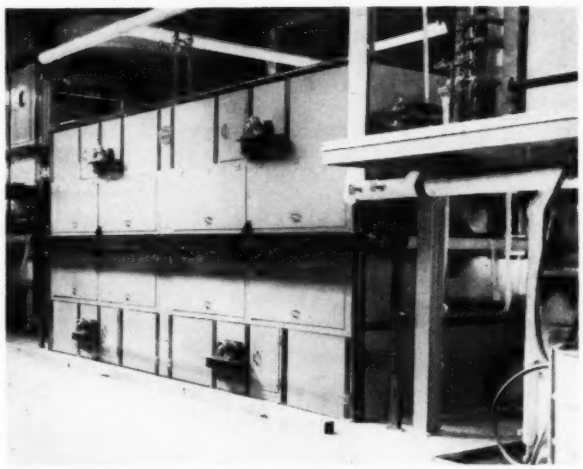


Figure 1
An external view of the Vapojet Dryer

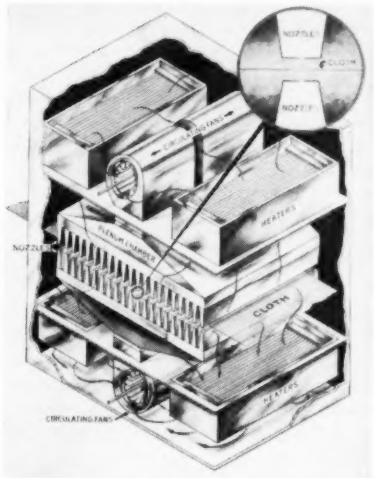


Figure 2
Interior construction of the Vapojet Dryer.

the actual heat loss is less than 7%.

You can see from the above brief description that, strictly from the standpoint of efficiency, a dryer using superheated steam will not produce more than one using air as the drying medium. It is also understood that the construction of a machine to be used with superheated steam requires a much more costly type of fabrication to insure that there is no heat loss through "through" metal, to provide better insulation so that the steam will not condense, and to be sure that there is no leakage of air into the enclosure. Therefore, if it is not more efficient and perhaps is more costly to build, why would a manufacturer decide to build dryers using vapor rather than air?

DRYING ACTION IN AIR DRYERS ——The most important point is the fact that, in a conventional air dryer, warm air currents absorb the moisture from surface fibers, which act as a wick drawing more moisture from the body of the cloth to be evaporated from the surface. This moisture, migrating by capillary action from the body of the cloth to the surface, means that much of the fiber and fabric is overdried to reach a point where all of the fabric is dried. Also, in applying any finish or resin, this capillary action brings much resin with it, which is left deposited on the surface of the cloth, not only spoiling the hand, but reducing the amount of resin left in the body of the fabric, thus minimizing its effectiveness.

DRYING ACTION IN VAPOJET DRYER——By using superheated steam and impinging it at high speed directly onto the cloth, the liquid in the cloth raises almost immediately to the boiling point, where it quickly passes off in the form of vapor, leaving the resin in the fabric where it is most effective. This superheated steam, which is being blown into and over the surface of the cloth at a speed of over 6,000 feet per minute, is partially condensed over the cold surface of the cloth at the entrance to the Vapojet Tenter. This condensing vapor liberates latent heat, which raises the temperature of the impregnating liquid to the boiling point. The fluid on the surface is evaporated, but, at the same time, the impregnating liuqid contained in the fiber is transformed into vapor, and the products in solution are kept inside the cloth in solid shape, while the vapor goes to the surface by expansion and cannot carry off any of the solid product.

Probably the most important point concerning the operation of this superheated-steam Vapojet Dryer is the fact that the boiling point is reached instantaneously by the impregnating liquid, and in this way there is no possibility of the capillary process of drying. This can only be made by the combination of superheated steam and the high speed of superheated-steam fluid. In static conditions, for example, superheated steam has no effect, even at high temperature. High velocity in air does not give the same result as superheated steam because hot air never liberates latent heat, and the specific heat of the air is low, so that, by using air dryers, the temperature of the impregnating liquid increases slowly and only reaches the boiling point when the liquid is practically evaporated. Using superheated steam as the drying medium rather than air eliminates the risk of oxidation or any other kind of alteration.

As is known, practically every air dryer actually overdries the fabric. This is the general tendency, rather than underdrying. Overdrying of any fiber gives a harshness to the hand that can be eliminated with the use of superheated steam, as a slight amount of this steam vapor is carried in the cloth as it is delivered from the Vapojet Dryer. This vapor condenses at room temperature, and provides a conditioning effect because the cloth will always contain a desirable residual moisture content. Thus, harshness and brittleness caused by overdrying are eliminated.

The amazing efficiency of the Vapojet Dryer can only be accomplished by a combination of this superheated steam and the high velocity at which this superheated fluid impinges on the fabric. As we have said, in static conditions, superheated steam has practically no effect, even at high temperatures.

As pointed out previously, the use of superheated steam as a drying medium is, by no means, a new or recent development. However, when it has been applied or tried before, it has failed for the following reasons:

First of all, there was too much fresh air admittance to the dryer to create a vapor atmosphere within the housing. Secondly, in practically every case, an exhaust was provided, which destroyed the vapor atmosphere, and, third, the effectiveness of the superheated steam was minimized almost completely by the distance from the nozzle opening to the cloth itself.

In the operation of the Vapojet Dryer, the steam is turned on in standard conduction-type heaters, and the dryer itself is warmed up. At that point, live steam is also admitted to the enclosure to create a slight pressure and force all of the air out of the dryer. The temperature of this steam, which at atmospheric pressure is 212°F, is then raised to 300°F by circulating through the heaters and is therefore superheated. From this point on, additional steam required to maintain the vapor atmosphere is provided by the

moisture evaporated from the cloth. Any excess escapes into airlocks at the entering and delivery end of the machine and is then exhausted. In other words, there is no exhaust on the machine, other than by pressure. This vapor escaping from each end of the dryer into the exhaust duct, which is located outside the dryer proper, forms an airlock prohibiting fresh air from entering from the room.

MILL EXAMPLES

As a specific example of the efficiency of this machine, as compared with existing air dryers or those which were designed originally to operate with superheated steam, but for practical purposes are operating on air, the following report is given:

A mill that was using a standard conventional Tenter Dryer with nozzle arrangements above and below the cloth, with a 90-ft frame and a 60-ft housing, was evaporating 30 pounds per hour per square yard of fabric. The nozzles in this dryer were approximately 7" from the cloth, which was necessary to clear the rails when varying widths were run. The static pressure inside the nozzles was approximately the same as in the Vapojet. However, the opening at the bottom of the nozzle was more than double the slot in our jet, which meant that, although they had the same pressure in the nozzle, 75% of the velocity of the impregnating fluid was lost before it reached the cloth, and for that reason it was necessary for them to have a housing 60-ft long instead of being able to do the job in 30 feet, which they could do with the Vapojet. These nozzles were changed over to the Vapojet System, that is, with the patented telescopic nozzles, which are located approximately 3/16" from the fabric, both above and below. When the width range is changed, the nozzle merely telescopes into itself, and the full effect of the high-velocity impregnating fluid is utilized.

After this change had been made and the exhaust fan had been shut so that the superheated steam atmosphere could be maintained, the production of the machine was increased to 80 pounds per square meter per hour. The steam consumption was reduced from 3½ pounds of steam for each pound of water evaporated.

We know of one dryer where the entire amount of air which is circulated is thrown away after one pass over the cloth, and the steam consumption runs as high as seven pounds of steam per pound of water evaporated.

To substantiate the economy of the Vapojet machine, I have here two discs from a Foxboro flowmeter, which represent a 48-hour continuous run on the Vapojet Dryer. You will see that the total weight of steam used averages less than two pounds of steam for each pound of water evaporated.

In using air as the drying medium, it is necessary to heat the air that enters the dryer at room temperature from, for example, 70 up to 300°F. This air is then blown through or over the fabric and is finally exhausted or thrown away. This process goes on repeatedly through the drying cycle. However, with the use of superheated steam vapor, steam vapor at 300°F is blown through the fabric, and a temperature drop occurs of approximately 30°F. This vapor is then recirculated and brought back to the 300°F, so that the heating coils actually have to reheat only 30° on each cycle, rather than 230°.

ADVANTAGES OF SUPERHEATED STEAM FOR DRYING

In summary, it can be said that the use of superheated steam as a drying medium rather than air, provides the following advantages:

1) Dries the fabric by raising the temperature of the impregnating liquid almost instantaneously, which is removed from the cloth in the form of vapor.

2) No capillary action occurs which deposits resins on the surface.

3) Eliminates migration of resins and dyes.

4) Eliminates oxidation of fibers or dyestuffs.

5) Eliminates overdrying.

6) Conditions the fabric.

7) Reduces the over-all operating costs in floor space required and amount of steam used per hour.

However, it must be thoroughly understood that the above advantages cannot be obtained unless the optimum conditions, which are available only in the Vapojet Dryer, are used, that is, impregnating fluid must not lose any of its velocity and must impinge directly on the cloth from the nozzle opening 3/16" from the cloth. Superheated steam of and by itself does not accomplish these advantages in a static condition. However, in the dynamic condition which exists in the Vapojet Dryer, any operator can expect these beneficial results.

AATCC SYMPOSIUM

HOTEL STATLER • NEW YORK • MAY 19, 1954

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"AATCC RESEARCH — KEY TO QUALITY"

1953 Annual Convention——"Science Fibers" Group

LAUNDERING PROPERTIES OF THE SCIENCE FIBERS*

GEORGE H JOHNSON

Vice President, American Institute of Laundering

INTRODUCTION

TO the laundry industry the so-called science, or chemical, fibers not only include nylon, Orlon, Dacron, Dynel, Acrilan, X-54 and Vicara, but also viscose and cuprammonium rayon and acetate. A laundry classifier "breaking" a customer's bundle of soiled textiles has time only to separate it into such major classifications as wearing apparel, flatwork, dress shirts, sport shirts, work to be tumbled-dried, hosiery, blankets, wools, silks, curtains, etc, and to net the pieces for separate washing and finishing. She has neither the time nor the skill to identify fiber content, especially in the case of blends. In a sport shirt or "silk" classification, for example, rayon, acetate, rayon and acetate, rayon and cotton, cotton and Dynel, or almost any blend that a designer could conceive of would be handled by one general washing method, the work being separated into white, light, and dark-color classifications.

Therefore, safe commercial laundry procedures, including washing, extracting and finishing, must be established to launder properly the fibers that require the *greatest* amount of care. And so articles made from all of the science fibers are laundered together at low temperatures and with short formulas. Fortunately, soil is removed from these fibers with little difficulty under most conditions.

Wool-appearing articles, such as blankets and hosiery, are washed as if they are all-wool, again because a classifier cannot always detect specific differences between a Dynel and a wool blanket, for example, and especially blends of the science fibers with wool. To her the blanket is wool-like in appearance, and therefore it should be washed as if it were all-wool to be on the safe side.

LAUNDRY PROCEDURES

WASHING———The washing of these many classifications, including blankets, draperies, hosiery, sport shirts, and dresses, with some exceptions, presents no serious washroom problem, providing the dyer has done his part in properly selecting and applying his dyestuffs. In Table I is a typical type of washing formula that would be used in the absence of wool. With heavily soiled work the temperature usually is raised to 120° F.

Low-titer soaps are used with added alkali in soft water at pH 10.5 to 11.0. Synthetic detergents may be substituted for soap. With full-sized loads, a fourth rinse is used. Sour is added to obtain pH 5.0, usually an acid fluoride or silicofluoride. Light colors should be washed entirely separately from dark shades. This practice avoids contact stains and a "darkening" of the lighter tints by bleeding darker colors.

G H Johnson

The increasing appearance of the new science fibers in the form of sport shirts, hosiery, dress goods, drapes and blankets has caused the laundry industry to give much thought to processing them. Fiber identification by laundry classifiers, especially in the case of blends, is almost an impossibility. The launderer therefore must set up his washing and finishing operations to take care of one general classification to avoid excessive color loss, felting of wool (if present), extractor wrinkles, and highlights from pressing. Usually, colored articles of this type are divided into a light and dark-colored classification.

Washing procedures are given for textiles containing these new science fibers; one procedure for those containing no wool and another for blends with wool. Extraction, preconditioning, drying, and pressing are also discussed. The specific behavior of various fibers in cleaning and finishing are presented.

Blends of the science fibers with wool are washed just as if they were all-wool in order to avoid felting the wool. Small-diameter washers operating at slow speed are used. The washer remains stationery during draining and filling periods. High water levels are employed with the washing temperature kept at 90° F or less. A typical wool-washing formula, either with low-titer soap and added alkali to obtain a pH value up to 10.5 or with synthetic detergents, is presented in Table II.

Souring practice varies all over the country depending upon the bicarbonate content of the water supply. Sufficient sour is added to obtain pH 5.0 whether this requires 2 ounces in a New England water supply or 8 ounces in a midwestern one. Further, with the use of fluoride-type sours, the launderer provides a low-cost method of mothproofing for his customers. Some plants use 2 to 3 pounds of a sour, such as zinc silicofluoride, in a 42" x 54" wool washer at a 15" water level for a load of 25 four-pound blankets. The load should be run for 2 or 3 minutes and then be allowed to soak for the remainder of a 10-minute period. Treatment is effective, but it

TABLE I
WASHING——NO WOOL PRESENT

Operation	*Water Level inches*	*Time minutes*	*Temperature °F*
1st Suds	5	5	100
2d Suds	5	5	100
3d Suds (if needed)	5	5	100
1st Rinse	10	3	100
2d Rinse	10	3	100
3d Rinse	10	3	100
Sour	5	3	80

TABLE II
WASHING——WOOL PRESENT

Operation	*Water Level inches*	*Time minutes*	*Temperature °F*
1st Suds	12	5	90
2d Suds	12	5	90
1st Rinse	12	3	90
2d Rinse	12	3	90
3d Rinse	12	3	90
Sour	12	10	90

* Presented at the Conrad Hilton Hotel, Chicago, Ill, on Sept 17, 1953. Submitted to the Reporter by the Editor of Proceedings on March 4, 1954.

should be noted that the sour is soluble in water and is removed during subsequent laundering.

Although many plants do not size such classifications as sport shirts (and certainly not wool) a number of successful operators do. Sizing in the form of such products as CMC and methyl and ethyl cellulose is added to the souring bath. A dextrine and modified glycerine monostearate mixture has also been suggested as a suitable sizing for sportswear.

For the most part, small open-end washers having 20-, 30-, or 40-pound capacities are used or the small so-called "pony" washers. Mechanical action thereby is reduced, but this normally is sufficient for proper soil removal in the case of the science fibers and blends thereof. Cotton items such as bed and table linen are laundered successfully in machines with a capacity of 300 or more pounds. Cotton still is the major textile fiber encountered in laundries today.

EXTRACTION AND PRECONDITIONING——After the washing cycle is completed, the work is extracted by centrifuging methods. The usual practice with the science fibers is to bring the extractor to full speed, and then to shut off the power. Even this reduced extraction cycle sometimes will produce extractor wrinkles that cannot be pressed out. Orlon, Dacron and nylon blends all require the least possible extraction. Drip drying is adequate in some cases prior to pressing because of the hydrophobic nature of these fibers.

Preconditioning to provide proper distribution of moisture throughout a garment, especially at seams or multilayers of fabrics, often is essential. This is particularly true of such items as sport shirts. Preconditioning is accomplished by a tumbling operation in which steam is drawn into the tumbler during the drying cycle. A live-steam jet is placed next to the air intake with a valve to control the flow of steam. Rayon, acetate, and the science fiber materials are placed in the tumbler *loose*, not netted. The tumbler is started and the steam is released from the jet. Duration of the tumbling operation varies according to the size of the load, type of fabrics, and temperature of the tumbler. Satisfactory conditioning is usually accomplished in 5 to 10 minutes.

When the garments are removed from the tumbler, they are shaken out and placed in a damp box in preparation for finishing. They then are covered with damp nets, vinylite, or similar materials to prevent moisture evaporation. Conditioning time ranges from 45 minutes to one hour. Pressing follows.

TABLE III
SHRINKAGE

Number of Launderings	*Warp %*	*Filling %*
	Fabric No. 1	
1	2.0	1.8
2	3.6	3.0
3	5.1	4.1
4	4.9	3.9
5	5.4	4.2
6	5.7	4.5
7	5.9	4.5
8	6.1	4.8
9	6.1	4.7
10	6.0	4.5
	Fabric No. 2	
1	2.4	2.2
2	4.4	3.4
3	5.4	4.5
4	5.3	4.7
5	5.3	4.5

PRESSING——The factors that have been found important in the proper finishing of the science fibers are padding, time, air pressure, steam pressure, and operator training.

The type of padding used is not nearly so important to the proper finishing of garments containing science fibers as is the maintenance of that padding. The firm and rather solid padding commonly used for the finishing of cotton dress shirts cannot be used on the newer fabrics, especially blends. Instead a soft "feather-bed" padding must be used. The padding should be so soft that little mechanical pressure is required of the press head in order to press hems, pockets, buttons and areas of multiple thicknesses *into* the padding. This provides for even distribution of pressure and reduces any tendency for the fabric to glaze or shine, especially at seams.

Press operators are trained to move rapidly. The length of time that a press head remains closed has so much to do with the control of glazing or fusing that it is advisable to equip presses handling this work with timers. Timers should be adjusted to open at the end of the shortest possible period of time and still provide a proper finish. The timer on each press must be set individually.

Air pressures of 45 to 50 pounds per square inch are sufficient. Steam pressure should be reduced to 55 psi (302° F) or even lower.

Corduroys, flannels, gabardines, or high pile fabrics are finished best on a steam, or drycleaning, press whereby steam may be blown through the fabric at the time of pressing. Ordinary hot-head presses pack down the pile or tend to produce a shine or glaze, particularly on gabardines.

SCIENCE-FIBER CHARACTERISTICS

The man-made synthetic fibers that have come from natural gas, petroleum products, coal, water, and air have a number of general characteristics that are somewhat in common. They are thermoplastic and in some instances have comparatively low melting points, necessitating careful finishing both under home and commercial-laundry conditions. They possess a high degree of tensile strength and good abrasion resistance. Many of them require special dyeing methods because of relatively poor dye affinity. In contrast to rayon and acetate, the newer science fibers are almost insensitive to water. Dyed blends, if inadequate dye procedures have been used, bleed during washing or in the presence of perspiration. The new fibers may be heat-set, and, being hydrophobic, they dry quickly following contact with moisture. They are resistant to laundry detergents and are easily washed. Also, they may be glazed unless pressing conditions are controlled.

NYLON——Nylon has replaced natural silk in the manufacture of women's full-fashioned hosiery. Even in women's seamless types the proportion of nylon ranks high in fiber usage. No unusual laundry problems occur except that spun-nylon men's hose may tend to "pill" with repeated use and laundering. Turning hose inside out prior to washing will prevent pilling of the face material during laundering.

Early postwar nylon shirtings in many cases proved to be very uncomfortable garments to wear. Today, nylon skip-dent and tricot knit fabrics are being offered for shirtings with the hope that shirts made therefrom will receive more general public acceptance.

If white nylon is pressed, it tends to yellow on prolonged exposure to temperatures above 300° F. The recommended method of removing this discoloration by using sodium chlorite and glacial acetic acid, however, is hardly one that can be passed on to a laundry, much less to the general public, because of the formation of chlorine dioxide fumes. Fortunately, the yellowing of nylon usually is not important in the case of dyed materials.

The following bleaching procedure is recommended by Canadian Industries Limited, Nylon Division:

1) Bleach at 120-140°F for 30 to 60 minutes in a solution containing 0.5 lb of Textone and 0.5 lb of glacial acetic acid per 100 gallons of solution. Time varies with the amount of discoloration. The temperature should not exceed 140°F.

TABLE IV
THE LAUNDRY CHARACTERISTICS OF IMPORTANT FIBERS

Fiber	*Detergent, Laundry Concentration pH 10.0 to 11.2 (1)*	*Sodium Hypochlorite at Concentration of 100 ppm*	*Laundry Sour at pH 5.0*	*Effect of Heat (Fahrenheit)*	*Stoddard Solvent and Perchlorethylene*	*Effect of Sunlight*
acetate	resistant	resistant	resistant	sticks to iron at 350 to 375°; shines at about 275°	resistant; soluble in acetone, phenol and glacial acetic acid (2)	more resistant than viscose
Acrilan	resistant	resistant	resistant	sticking point, 455°	resistant	resistant
cotton	resistant	resistant	resistant	yellows at 248° after 5 hours; decomposes at 302°	resistant	loses strength gradually
cuprammonium rayon	resistant	resistant	resistant	decomposes at about 300°	resistant	loses strength gradually
Dacron	resistant	resistant (3)	resistant	melts at 480°	resistant	loses strength gradually
Dynel	resistant	resistant (3)	resistant	fusing starts at about 246°	resistant; attacked by acetone; soluble in dimethyl formamide	darkens, some strength loss
nylon	resistant	resistant (3)	resistant	yellows at 300°; melts at 482°	resistant; soluble in concentrated (90%) formic acid	good resistance for bright yarns; less for semi-dull
Orlon	resistant	resistant (3)	resistant	yellows at 300 to 330°; sticking point, 455 to 480°	resistant	resistant
Vicara	resistant	chlorinated, yellowed (3)	resistant	no effect up to 350°; melts at 470°	resistant	loses strength slowly
viscose rayon	resistant	resistant	resistant	decomposes at 350 to 400°	resistant	loses strength gradually
wool	resistant up to pH 10.5 at laundry concentrations	chlorinated, yellowed. May be bleached with peroxide or sodium perborate	resistant	harshens at 212°; decomposes at 266°	resistant	loses strength gradually

(1) Soap concentration, approximately one-tenth of one percent.
(2) Fortisan is insoluble in acetone.
(3) Hot acidified sodium chlorite may be used to bleach white nylon, Orlon, Dacron, Dynel or Vicara. Hypochlorite is of no value.

2) Rinse with warm water.

3) Scour at 120°F for 30 minutes in a solution containing 2 lb of soap and ¾ lb of sodium hexametaphosphate or other suitable sequestrant per 100 gallons of solution.

4) Rinse with warm water.

Certain precautions must be taken in using acidified sodium chlorite. Textone corrodes most metals including the majority of stainless steels. Glass, porcelain, and agate containers, however, are resistant. For one or two articles a porcelain pail may be used.

Bleaching must take place in a well-ventilated area since the fumes of chlorine dioxide are somewhat toxic.

It is important, too, that an operator handling sodium chlorite wear heavy rubber gloves to avoid any possibility of dermatitis from contact with the skin.

When nylon tapes are used on cotton butchers aprons, the tapes may become heavily stained from grease and soil attracted to the nylon. Lower-temperature washing has been suggested to avoid having greasy soil penetrate deeply into the fiber, as high temperature promotes the penetration of greasy soil. However, the removal of grease from cotton aprons nearly always requires the use of high-temperature washing formulas.

Seam puckering has been a commonly encountered problem in the case of nylon wearing apparel.

Common laundry problems experienced with nylon include the tendency for garments made of filament yarn to slip off the press buck, the formation of extractor wrinkles, and the tendering effect of marking inks containing cresol and phenol when applied directly to nylon.

Colored nylon blends with wool sometimes bleed, apparently because the synthetic fibers dry rapidly and tend to draw moisture from the dyed wool by capillary attraction.

ORLON ——— Orlon, an acrylonitrile polymer fiber, also tends to yellow with heat. It, too, may be bleached with hot acidified sodium chlorite. Blended with wool, Orlon has been made into fabrics of considerable interest for women's wear. Extractor wrinkles have been a problem in a number of cases. Some companies have experienced the problem of having their Orlon-wool fabrics wash satisfactorily, only to have a slight shrinkage develop on the press.

This is illustrated by tests conducted with two 55% Orlon-45% wool fabrics that were washed and pressed repeatedly on a hot-head press operating at 100 pounds of steam pressure, with the results in Table III.

In the case of pleated Orlon-wool dresses, although the fabric washes without difficulty, a rough-dry finish is produced that frequently necessitates repressing and repleating. It has also been observed that wool-Orlon blends tend to develop less shrinkage during laundering if they are sponged or otherwise preshrunk prior to cutting.

DYNEL ——— Dynel staple is a 40% acrylonitrile and 60% vinyl chloride copolymer. Several washing problems have been encountered with materials containing this fiber. Light colors have been observed to develop a dingy tint. Soil from the suds bath seems to be attracted to the fibers and "muddies" light colors. The dinginess that develops is accelerated with repeated laundering.

Laundries have been cautioned not to dry Dynel hose on closed heated forms operating at 100 pounds of steam pressure. If they are dried in this manner, such hose shrink excessively and become unwearable. Drying on warm-air circulating forms, however, is satisfactory. Difficulty arises because many laundries still use closed forms and the operator does not always recognize Dynel. To her a sock may be nylon, Dynel, Orlon or wool. If such hose are tumbler dried, progressive shrinkage develops in the case of Dynel.

Dynel blankets should be air-dried. If attempts are made to touch up the satin bindings with a hand iron, the fibers underneath the binding or those at the edge will fuse under the iron.

OTHER SCIENCE FIBERS AND TRENDS ——— Up to now not enough washable articles containing Dacron,

Acrilan, or X-54 have been sent to laundries for the industry to draw many conclusions. However, it has been observed that some Acrilan, Acrilan-wool, Acrilan-viscose and Acrilan-cotton blends have shown a tendency to shrink when pressed.

It has been reported that the collars and cuffs of some white Dacron garments cannot be washed satisfactorily in some cases. One theory for this is that the body oils and perspiration of some individuals are of a type that is difficult to remove from the polyester fiber.

Vicara blended with viscose and cotton has shown good laundering properties when used in women's sportswear.

Another new development in the textile field that the laundry industry it watching with interest is the new dope-dyed acetate-filament products, Celaperm and Chromspun. The extraordinary results in wash and light fastness reported, as well as the freedom of these products from fume fading and crocking, point to excellent consumer acceptance of fabrics made from dope-dyed acetate. The industry also is waiting for dope-dyed viscose-filament fabrics and the development of washable fabrics made from dope-dyed acetate and viscose staple.

Note: Since this paper was presented, spun-dyed viscose has been produced by such firms as American Enka, Bemberg, Courtaulds, Inc, Swiss Viscose Society, and others. Spun-dyed Dynel is also being produced. Patents have been applied for dope-dyed nylon and Dacron.

REPORTS FROM THE LOCAL SECTIONS

Rhode Island

AT the February 25, 1954 meeting of the Rhode Island Section, held at Johnson's Grill, Providence, R I, Prof Edward R Schwarz, head of the Textile Division, Massachusetts Institute of Technology, gave a paper entitled "Fiber Placement in Yarn and Fabric. There were approximately 225 members and guests in attendance.

At the March 25, 1954 meeting, held at the Sheraton Biltmore Hotel, Providence, R I, Myron J Eiseman, vice president, United International Corp spoke on "International Sales and Merchandising and Comparison Overseas" and Maurice R Fox of Imperial Chemical Industries and Arnold, Hoffman & Co, Inc presented a paper entitled "Application of Vat Dyestuffs". There were approximately 230 members and guests in attendance.

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Philadelphia

THE Philadelphia Section will hold its annual outing at the Manufacturer's Golf and Country Club, Oreland, Pa, on Friday, May 21st, 1954.

Fred V Traut, chairman of the Section, has appointed Donald W Robinson of Para-Chem Inc to act as general chairman of the Outing Committee. Mr. Robinson states that, in addition to the usual events, such as golf, cards, darts and quoits, many additional special activities will be offered to those in attendance. The day will be climaxed by a roast beef or rockfish dinner, followed by an evening of entertainment. Many prizes will be distributed throughout the day to members and guests.

Reservations may be placed with Ernst W Empting, General Dyestuff Corporation, 123 South 2nd Street, Philadelphia, Pa.

February 25th Meeting
Rhode Island Section
Johnson's Grill
Providence, R I

(Photos by John E Trezise)

Western New England

A MEETING of the Western New England Section was held on Friday, March 19, 1954 at Rapp's Restaurant, Shelton, Connecticut. Approximately 60 members and guests were present.

The technical part of the program consisted of a talk by Raymond W Jacoby, Department and Branch Manager for Ciba Company, Inc, on "A Former Textile Plant Manager Looks at the Statistical Approach to the Solution of Textile Problems".

New Bedford Institute

THE New Bedford Institute of Textiles and Technology Student Chapter met on March 9th with 20 members present.

Plans were completed and a poster was erected at the Institute announcing an essay contest under the sponsorship of the Chapter. The topic selected was "Why I Chose to Study in the Field of Textiles." The contest is open to all NBITT students with an outstanding reference book in the winner's field of study as first prize. The contest closes May 8th.

THE DYEING OF TEXTILE FIBERS UNDER STATIC PRESSURE

LOUIS DRIJVERS

Teinturerie de Groeninghe, Courtrai, Belgium

The author describes the results obtained by the static process Steverlynck in a pressure-circulating machine dyeing.

The static pressure used in the machine is claimed to 1) permit dyeing at temperatures above 100°C (212°F); 2) have a stabilizing influence on both dyebaths and bleaching baths; and 3) eliminate surface oxidation when using reducing baths and thus effecting a considerable saving in sodium hydrosulfite.

INTRODUCTION

WHEREAS in an earlier article by the author *(1)* the sole question of dyeing of textile fibers at high temperatures (above 100°C) was examined, this article expands the subject by examining in general terms the role played by static pressure in dyeing. This role, which is not limited to high-temperature ranges, can be useful in various ways:

1) *It allows dyeing to be effected at temperatures above 100°C (212°F).* In this respect it suffices that the pressure at all times is equal to or slightly superior to the vapor pressure in the dyebath, so that the centrifugal pump can operate at its maximum efficiency regardless of the temperature. This is achieved in the static process Steverlynck machine by the introduction of compressed gas into the upper part of the expansion chamber.

2) *It has a stabilizing effect on both dyeing and bleaching baths.* In cases where baths contain products with a tendency to decompose, particularly under the influence of a rise in temperature, such decomposition generally results in a state of chemical equilibrium. This may be retarded by static pressure in cases where one of the products of decomposition takes a gaseous form.

3) *Contact of the bath with air in the circulating machine may be reduced to a minimum.* The considerable importance of this in the conservation of reduction potential in dyebaths will be discussed.

I THE DYEING OF FIBERS AT TEMPERATURES ABOVE 100°C

Since the publication of the aforementioned article *(1)*, which set out the basic theories leading to the establishment of a process for dyeing at high temperatures, work has continued on the same basis, but on a plant scale. The results obtained completely confirmed the point of view already adopted.

Protein Fibers

CHEMICAL AND PHYSICAL REACTIONS———Recent work on both the morphological structure of wool and its chemical constitution has made it possible to understand more fully the chemical and physical reactions which take place when that fiber is dyed.

The principle polypeptic chains of wool are linked by secondary chains as shown in Figure 1. These secondary chains are:

1) The saline bridge linking the acid and the basic sections, the latter constituting amine acids;

2) The hydrogen links on secondary valences; and

3) The cystine links joining together the principal chains by the bridges S-S *(2)*.

The first two are directly responsible for the fixation of the dyestuff. The third, which is indirectly responsible, must be protected as far as possible as it confers on the fiber its particular mechanical properties.

Each dyeing process must be so controlled that, as a result, the fiber exhibits no degradation, maximum exhaustion is achieved and the dyeings exhibit the highest fastness to both washing and to rubbing.

The saline bridges are broken down in an acid bath, an equilibrium being established for determined pH values following the reaction:

$$R-COO^{-}.....NH_2-R' + H_2SO_4 \rightleftharpoons R-COOH + R'-NH_2SO_4H$$

Dyestuffs can fix themselves on wool in this fashion.

Following the work of Lister (3), the preparation of wool for dyeing by conditioning it to a determined pH value appears to have been accepted as general practice. In effect, he recommends optimum dyeing conditions on the basis of determined pH values. We no longer agree with the view that each dyestuff corresponds to a maximum pH and are more inclined to the theory laid down by Zuber of the Societe Francaise de Matieres Colorantes (*4*), which states that the optimum pH depends not only on the dyestuff but on its concentration in the dyebath. Zuber, in defending this attitude, states that the more one wishes to fix the dyestuff on the fiber the more necessary is it to open the salt links of the keratine.

In the dyeing method under review, this statement has been borne in mind and a pH is so fixed that exhaustion of the color is achieved by a progressive raising of the temperature to 105°C. This pH for dark shades is slightly lower to that suggested by Lister.

A change takes place between the anion of acid dyestuffs, dissociated in the dyebath, and the keratine salt, R'—NH_2—SO_4H, resulting from the breakdown of the saline bridges.

This change takes place as follows:

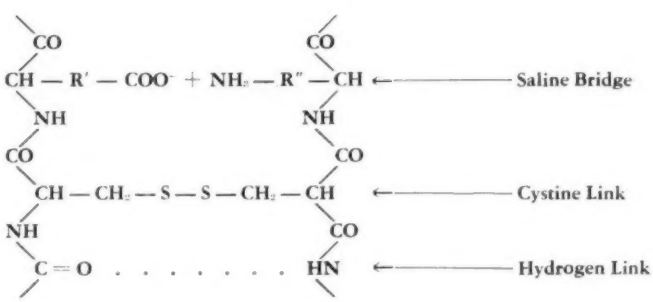


Figure 1

$$Col^- \ldots . H^+ + R' - NH_2SO_3H \rightleftharpoons H_2SO_4 + R' - NH_2 - Col.$$

This equilibrium is established on the outer surface of the fiber. The interior, protected by the surfaces in contact with the bath, is not affected in the reaction. However, wool swells and, parallel with the first reaction, a breakdown of the cystine links is produced. As a result of this breakdown the space between the principle, parallel chains is enlarged, thereby increasing the wool's volume and so enlarging the surfaces in contact with the bath. At the aforementioned pH values, which are close to the isoelectric point, this progressive breakdown is almost solely due to the raising of the temperature. At the moment that all the mass of the wool is in contact with the dyebath liquor the dynamic and chemical equilibria oppose each other.

In the normal processes for the dyeing of wool this dynamic (and therefore, chemical) balance is only obtained after a prolonged dyeing period at the boil. In processes normally given in dyestuff manufacturers' pattern cards for wool dyeing it is found that the recommended time for treatment at the boil is rarely less than 60 minutes.

In our dyeing process the raising of the temperature is carried out progressively from 50° to 60°C (122-140°F) to above 100° C (212°F). At this latter point the chemical and dynamic equilibria are established instantaneously. Therefore, a considerable reduction in the dyeing time is effected.

The time factor is also of importance from the point of view of alteration in the wool. In effect, it has been provided, from results of comparative physical analyses of fibers dyed under different conditions, that the degradation of the fiber is also a function of the duration of treatment; therefore it seems that wool exposed for a short time to high temperature is degraded less than when it is exposed for a longer period at the boil.

It is imperative that the temperature should not exceed 105°C (221°F). Dynamometric experiments have proved that degradation of wool is very much accelerated from 115°C (239°F) even after a relatively short period of exposure.

The dyeing process conceived is illustrated by the graph in Figure 2.

Thus it may be seen that the process has 3 stages:

1*st Stage* (*A-B*). *Conditioning of the wool to such a pH that exhaustion of the bath will be completed at* 105°C (221°F). This pH is generally found in the isoelectric zone. This stage is carried out at between 50° and 60°C. (122-140°F).

2*nd Stage* (*B-C*). *Progressive increase in the temperature from* 50° (122° F) *to* 105°C (221°F). The time for this phase varies from 15 to 30 minutes dependent both on the nature and on the form of the material being dyed as well as on the dyestuffs being used.

3*rd Stage* (*C-D*). *Maintenance of the temperature from* 5 *to* 10 *minutes*. In most cases this stage is superfluous. A longer time appears to be necessary only in those cases where levelling is difficult.

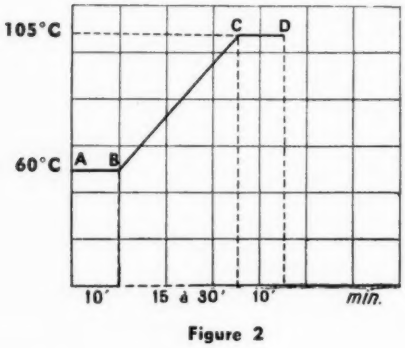


Figure 2

THE LEVELLING POWER OF DYESTUFFS FOR WOOL———It is of no help to the dyer to classify dyestuffs according to their chemical constitution, as this is purely the domain of organic chemistry. For practical purposes it is clearly more important to base dyestuff classification on tinctorial properties, notably levelling properties, dyeing behavior and fastness properties.

Thus, generally speaking, such a classification might be comprised of 2 groups:

a) dyestuffs having good migratory properties,

b) milling dyestuffs.

Level-dyeing acid dyestuffs permit a rapid increase of temperature. Shading with these at high temperatures presents no problems, their molecules being small enough so that they migrate easily.

This is not always the case with the acid milling dyestuffs. In their case there appears to be a critical temperature below which they are in an aggregated state and so cannot act. Above this critical temperature the aggregates disperse and so chemical reaction with the wool becomes possible. It seems preferable to raise the temperature for these dyestuffs dyeing acid dyestuffs.

In each of the classified groups mentioned above, there are dyestuffs in which the existence of secondary valencies (Van der Waal Forces), hydrogen links, etc, lead to their having a more or less marked affinity for wool. Thus, there still remains the task of selection. Obviously data established as a result of experiments carried out at temperatures below 100°C (212°F) will not be valid in all cases when applied to a process carried out above this temperature. It is now evident that equilibrium can be established between molecularly dispersed dyestuffs and aggregated dyestuffs at high temperatures, a phenomenon that explains why certain dyestuffs alleged to have had no levelling ability are perfectly suitable as shading colors.

CONCLUSIONS———The dyeing of wool at high temperatures is easily realizable given adequate dyeing methods and provided certain precautions, the main one of which is not to exceed the maximum permissible temperature, are observed. When compared to the old method the new one provides important advantages, notably:

1. *The ease of obtaining level shades.*

The high-temperature process extends the range of dyestuffs with migratory properties. Many dyestuffs, which despite the utmost precaution normally give bad or medium results on crosswound cheeses, can be employed successfully using the high-temperature process.

2. *Ease of shading.*

This property goes hand in hand with the preceding one. The SPS machine is equipped with a sampling pot and a main chamber, it being possible to isolate the former from the latter in such a manner that control and eventually correction of shade can be carried out without having to interrupt the process of dyeing under pressure.

A systematic study of the members of each group of dyestuffs still remains to be carried out in order that those members possessing excellent migratory powers at high temperatures can be employed as shading colors. Results of sufficient interest have been obtained in practice when yarn is dyed on bobbin and card sliver form.

3. *Considerable reduction in the dyeing time.*

By this process rarely does one exceed half the dyeing time laid down for normal methods. Figure 3, covering both dyeing and shading, illustrates the comparative reduction in time.

4. *Complete exhaustion of dyebaths.*

Cellulosic Fibers

An earlier article (*1*) describes quite fully the theoretical basis of the SPS method. It will therefore be sufficient to only briefly describe the method for dyeing cellulosic fibers at high temperatures.

The real difference between the process described and the conventional one is that the former proceeds through temperature stages of inverse order to the latter. This is illustrated in Figure 4, which shows the stages of exhaustion in terms of time and temperature.

It may be seen that, between A' and B', there is insufficient time for the establishment of the physico-chemical equilibrium because at low temperatures the inertia of the dyestuff particles is also low.

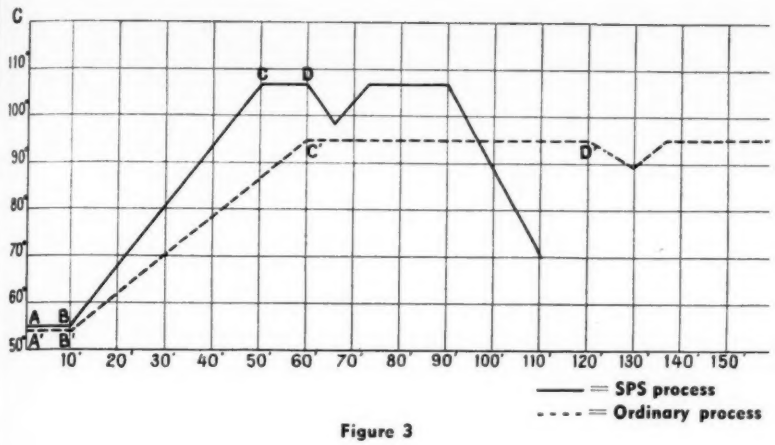


Figure 3

From point C' the temperature is such that inertia no longer is significant and dispersion of the dyestuff takes place. The physico-chemical equilibrium is obtained in an extremely short time and, from this point, dyeing is carried out on the curve CD.

In the dyeing process under discussion the dyebath is brought into the migratory zone as quickly as possible, this zone being situated beyond the point at which maximum exhaustion is achieved.

By slow cooling, exhaustion of the bath takes place progressively and the state of equilibrium existing at the high temperature gradually changes to that at the lower temperature.

The outstanding advantages of this process are good levelling and short dyeing time.

COTTON———In the dyeing of cotton it does not appear to be necessary to exceed 100°C (212°F). Nevertheless, the dispersion of the dyestuffs in the dyebath and their diffusion into the fibers are increased to such an extent, as compared with the effects at 92°C (198°F), that the resultant advantages are very important.

The progress achieved is mainly with regard to dyestuff stability. Many direct dyestuffs start to reduce at 100°C (212°F). Certain products released by the decomposition of the cellulose act as reducing agents and are capable of destroying the azo link in the dyestuff's molecule. This happens much more easily in an alkaline bath, benzo-copper colors being extremely sensitive to alkali.

To stop this decomposition it is quite sufficient to remove alkalinity and dye in a bath with a pH close to 7. The addition of a small amount of ammonium sulfate generally proves to be sufficient.

It is a fact that the most sensitive dyestuffs do not undergo any change in dyebaths that have been suitably neutralized; this is easily seen in that shades no longer become duller and fastness properties are not impaired.

Erich Hermann (5) classifies direct dyestuffs according to their stability at 120°C (248°F). Dyestuffs in the first category remain stable, there being no need to add protective agents, while other categories need such agents. The quantities of chrome mordant recommended to obtain stability are given in the article.

STAPLE VISCOSE RAYON———No difficulties arise in ensuring uniform dyeing of viscose rayon staple at high temperature either in bobbin or beam form. One must note that, with fibers of the regenerated cellulose type, it is very necessary to increase precautions regarding adjustment of pH values. These fibers, owing to their nature, carry over into the dyebath large amounts of the products which decompose and give rise to reduction of the dyestuffs used.

VISCOSE RAYON———The same remarks apply as for staple viscose rayon. The classification of direct dyestuffs as laid down by the Society of Dyers and Colourists can serve as a basis for determining the migratory zone of these dyestuffs. Thus with class "A" products 110°C (230°F) is sufficient while for class "C" it is necessary to raise the temperature to 125°C (257°F).

CUPRAMMONIUM RAYON ——— For the dyeing of the cuprammonium rayon, one must first examine certain factors as follows:

The swelling of the fiber. Whereas swelling of the fiber creates many difficulties in the dyeing of viscose rayon cakes (this leading to poor and irregular penetration of the liquor), it is even more serious in the case of cuprammonium rayon cakes where it is more pronounced. It appears that an increase in temperature above that at which maximum swelling of the fiber takes place is of benefit in softening the fibers.

The migration zone of dyestuffs. Generally speaking, it may be concluded that maximum exhaustion takes place at temperatures much lower than in the case of viscose rayon.

Maximum exhaustion. Generally the exhaustion is greater than in the case of viscose rayon.

Sensitivity of electrolyte. Greater care is required when applying direct dyestuffs to cuprammonium rayon then to viscose rayon.

Absorption rate. This is much higher in the case of cuprammonium rayon dyeing.

The latter three properties make it difficult to obtain level results. Also it is necessary to take advantage of the first two properties in order to obtain level results on cuprammonium rayon cakes. Trials have proven that migration of most of the direct dyestuffs is easily obtained between 115 and 120°C (239°F-248°F).

Clearly any reduction of direct dyestuffs may be prevented by observing the same precautions as laid down for dyeing viscose rayon.

Synthetic Fibers

Recently published literature is full of detailed descriptions of dyeing processes for synthetic fibers; consequently one can refer to these whenver it seems that the employment of high temperatures is indispensable for their dyeing eg *(6)*.

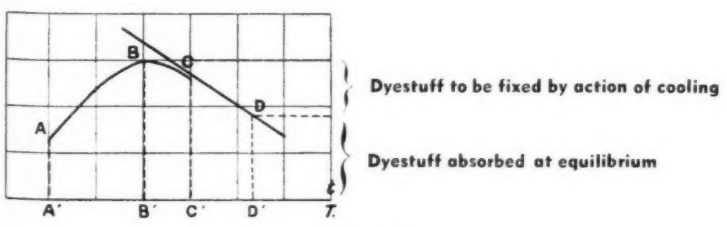


Figure 4

II STATIC PRESSURE AS A STABILIZING AGENT IN DYEBATHS AND BLEACHING BATHS

The phenomena described in this section should be examined from the point of view of Chatelier's law on the displacement of physical or chemical equilibria.

Two cases may arise. Either two products in dissolution may react chemically,

one with the other, thereby forming new products at least one of which is in a gaseous form:

$$A + B \rightleftharpoons C + D$$

or the product in solution in the bath may decompose, e g, following a rise in temperature, producing gaseous products, or at least one of them in a gaseous form:

$$A' \rightleftharpoons B' + C'$$

In both cases this leads to an increase in volume since the volume of the products of decomposition is greater than the volume initially. If the reaction is carried out in a closed vessel a static pressure will be produced, which can become equally important from the point of view of either retarding or stopping the decomposition.

Hydrogen peroxide is stable in the presence of acid but when alkali is present and the temperature is raised it decomposes freely according to the following equation:

$$2H_2O_2 \rightarrow 2H_2O + O_2$$

If cellulosic fibers are bleached under these unstable conditions in a closed vessel the oxygen liberated increases the static pressure already present as a result of the bath's expansion, which is brought about by raising the temperature, for example, to 110°C (230°F).

To exert a considerable amount of control over the decomposition of the peroxide, which has no bleaching effect whatsoever, it is quite sufficient to apply a static pressure of 3 to 4 kilos.

A point to note when bleaching under the circumstances mentioned above is that the operation appears to exert an influence on the fiber's morphological structure. This influence modifies to advantage the fiber's mechanical properties, there being among other things an increase in its dynamometric power.

Vat dyebaths in a reduced state are very unstable from certain temperatures onwards owing to the decomposition of sodium hydrosulfite. It has been possible to maintain the reduction potential of dyebaths indefinitely at 105°C (221°F) by means of a static pressure of 1 to 2 kilos.

This phenomenum is of greater importance in the examination of dyeing methods for applying vat dyestuffs to synthetic fibers, notably Perlon and Orlon.

In all these cases static pressure will not only prove an important factor as regards the smooth running of centrifugal pumps, but also as a stabilizing influence on dyebaths. Dyeing with vat dyestuffs at high temperatures presents some extremely difficult problems especially those connected with the stability of the leuco products. Good results appear to have been achieved by incorporating inhibitors in the dyebath in order to prevent over-reduction.

Among these inhibtors the most commonly used is sodium nitrite. This allows the oxidation-reduction potential to be reduced to such a level that over-reduction becomes impossible while at the same time it is quite sufficient to convert the dyestuff to its normal leuco-form; furthermore sodium nitrite will react with the dyestuffs to form a stable compound. Zimmerman, Mecco, Fordenwalt and Cooke have listed those vat dyestuffs which are susceptible to stabilization by sodium nitrite *(5)*.

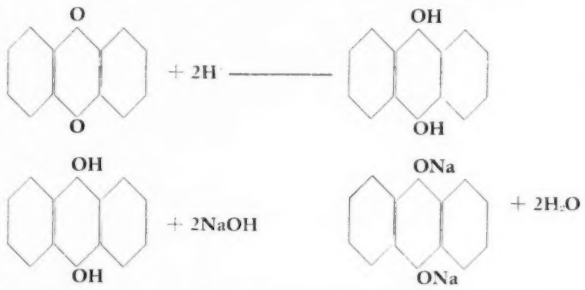
This method could be used in many instance either to replace or to improve the pigmentation process when dyeing viscose rayon cakes. There are means of applying a number of dyestuffs, some of which are stable thanks to their constitution, while others can be rendered stable by adding the necessary products. At the moment trials are being carried out.

Good results as regards penetration have been obtained both with tightly twisted threads and with those fibers in which diffusion of the dyestuffs has proved to be impossible using normal methods.

III STATIC PRESSURE AS A PROTECTIVE AGENT AGAINST OXIDATION BY THE AIR OF REDUCED DYEBATHS

Sodium hydrosulfite and caustic soda react as follows with vat dyestuffs:

$$Na_2S_2O_4 + 2H_2O \longrightarrow 2NaHSO_3 + 2H$$



With these reactions it is possible to calculate theoretically the amounts of chemical products necessary for reduction purposes. However, industrial practices call for much larger amounts. Generally speaking one calculates that for dyestuffs using the IN and IW processes 45 and 20 times the theoretical amounts of caustic soda are required respectively, to form the sodium salts of the leuco compounds, while with sodium hydrosulfite 10 times the theoretical amount is required.

In the case of sodium hydrosulfite this excess is considered necessary owing to the fact that the oxygen present in the atmosphere reduces by its oxidizing action the dyebath's reduction potential. Therefore, during the dyeing process it is necessary to add hydrosulfite to the dyebath.

At the same time it is necessary to add caustic soda, as this is partly used in the neutralizing action of the bisulfite and also in order to preserve the pH of the dyebath, thereby ensuring the leuco product's solubility.

Centrifugal pumps that are not completely watertight around the packings tend to suck in air at such points and it is necessary to keep an eye on the reduction potential of the dyebath. This method of control means that, during dyeing, additions of sodium hydrosulfite and corresponding amounts of caustic soda have to be made to the bath.

In using circulating machines as at present it is not unusual to see an excessive consumption of hydrosulfite, which can be anywhere between 5 and 6 grams per liter even though the dyeing method calls for only 2 to 3 grams per liter.

With the SPS machine one need only apply a static pressure of 0.5 kils to stop completely any entry of air. Thus, the dyebath is amazingly stable *(7)*.

For example, using the SPS machine 500 kilos of cotton on crosswound bobbins can be dyed to a 2% shade using Indanthrene Blue RSN powder and employing 6 kilos of sodium hydrosulfite. With other dyestuffs, such as Indanthrene Dark Blue DB, the same amount of cotton can be dyed using 9 kilos of sodium hydrosulfite as a maximum.

During the dyeing process no other addition is necessary.

REFERENCES

(1) Drijvers, L, *Teintex* No. 5 (May, 1952); *Melliand Textilber* No. 6 (1952); *Textielwezen* No. 4 (1952); *Am Dyestuff Reptr* 42, No. 6 (1952).

(2) Flamant, "The Dyeing of Wool", *Teintex*, p 609 (Nov, 1951).

(3) Lister, *J Soc Dyers Colourists* 65, 97 (1949).

(4) Zuber, C, "The Application of pH and rH in Dyeing", *Teintex*, p 360 (June, 1952).

(5) Herman, E, *Melliand Textilber* No. 12 (Dec, 1952).

(6) Zimmerman, C L, Mecco, J M, Fordenwalt, F, and Cooke, T F, "Controlled Vat Dyeing—The Stabilization of Vat Dyes at Elevated Temperatures", *Am Dyestuff Reptr* 41, No. 20, p 597 (Sept 29, 1952).

(7) Steverlynck, B, *Moniteur Textile*, No. 5 (May, 1952).

THE McKIERNAN-TERRY MULTI-PURPOSE CALENDER

A New Approach to Calender Design

JOHN W WILKINSON

McKiernan-Terry Corporation, Harrison, N J

INTRODUCTION ——— Durable finishes on various constructions of cotton fabrics can be obtained by impregnation with thermosetting resin formulations, calendering at high temperatures and polymerization. Since the finish may require frictioning, Schreinering or embossing it appeared to be logical to develop a calender which, by use of simple modifications, could be converted to any one of these applications.

DEVELOPMENT OF THE 2-ROLL FRICTION CONCEPT ——— Friction work in the past had usually been handled on a 3-roll friction calender; however, no good functional reason seemed apparent as to why this should not be done on a 2-roll calender other than the problem of maintaining friction ratio between a fixed diameter top roll and a varying diameter filled-center roll made necessary due to roll wear and resulting turn downs to refinish.

With the top and bottom roll tied in a definite ratio, and with the center filled roll used as an idler, the peripheral speed of the center roll was obtained from, and was aproximately that of, the bottom roll. Cloth entered the nip at the bottom, wrapped around one side of the filled roll and passed through the nip at the top, at which point frictioning was accomplished —the wrap around serving to restrain the cloth against the higher surface speed of the top roll.

Some finishers, possibly due to uneven

J W Wilkinson

tensions caused between bottom and top nips, threaded calenders through the top nip only. This seemed simpler, and further, cut down the danger of roll marking by eliminating the extraneous nip. However, when this method was used it became necessary to restrain the filled roll to prevent over feeding or loss of friction.

The above seemed to produce excellent finishes with less difficulty at higher speeds and created the thinking which led to the elimination of the bottom roll entirely. Once this was done and it was found that a 2-roll friction calender matched previous qualities of finish produced with a 3-roll calender at given or even higher speeds, the conception of frictioning, Schreinering and embossing on a single machine was realized.

To obtain an even finish a constant friction ratio is maintained when processing a given run of cloth. Customary friction ratios range from 25% to 100%. In addition finish can be altered or modified by increase or decrease in pressure and temperature.

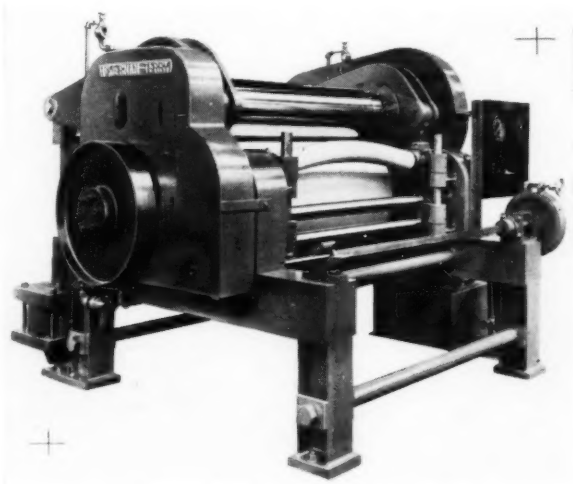
EVOLUTION TO THE MULTI-PURPOSE DESIGN———The concept of the new functional Multi-Purpose Calender is based upon the preceding facts; once a 2-roll friction calender was properly developed the possibility of a Schreiner application by submission of rolls and eliminating gearing became practical. Moreover, by disengaging one gear the 2-roll friction calender could become a rolling calender. By similar reasoning, a shift of gears to a 2:1 ratio with a third roll change could provide an embossing application which, within machine limits, would cover the entire range of embossing roll sizes without further gear change.

The problem of combining all of the above possibilities in a basic machine was given to the Engineering Department for solution. This problem was solved and a new completely functional Multi-Purpose Calender is the result.

ECONOMIES TO BE CONSIDERED ———Designed to cover all three applications employed for resin finishing, it made possible a saving of the capital investment required by purchase of a 3-roll friction calender, a 2-roll Schreiner calender and an embossing machine with their motor drives, and further saved the floor space requirement of three machines and their installation. The importance of these savings is emphasized by the trends in today's textile market which might result in any two of the three machines standing idle while the third was working. When jumping seams, reduction in loss of finished goods due to the single nip provides additional savings.

DESIGN FEATURES———The design gave consideration to past complaints of calender operators and maintenance men. Among such complaints was the time consuming job of roll changes on old type calenders. Complete accessibility for roll changes was built into this modern design. Both rolls and gearing can be changed in this unit in a few hours to convert it from one application to another.

Removal of bearings became a simple process, for—following the steel industry's



McKiernan-Terry Multi-purpose Calender

rolling mill practice—the design incorporates hydraulic means of bearing removal by use of a portable high pressure pump.

Oil leaks at high temperature were reduced to a minimum by use of special oil seals which operated effectively at temperatures up to 500° F.

A simple positive roll adjustment was provided to give correct new center distance after roll turn down without use of shims or any other makeshift arrangement. This adjustment was applicable regardless of whether the calender was in use for friction, Schreinering or embossing work. Varying sizes of engraved rolls can be compensated for positively and rapidly.

Constructed for a maximum capacity of 75 tons, using modern materials and alloys, with oversize antifriction bearings and heat treated alloy steel gearing, adequate strength was provided for minimum wear. Latest lubrication methods of circulating cooled, filtered oil insure the longest possible bearing life. Dual controls and gages furnish the operator complete control at all times since he now can adjust pressure across the roll face simply and effectively.

CONCLUSION ——— This Multi-Purpose Calender has been designed and presented by McKiernan-Terry to keep pace with the progressive demand for more flexible textile machinery to incorporate simple yet positive control for improved and easy operation.

• ABSTRACTS •

The Effect of Copper in Wool Dyeing

L F Story, *Textile Mfr* 79, 654-5, December, 1953.

In wool dyeing and finishing copper is well known for its effect on some dyes and as the cause of stains. In the past the copper has usually been derived from parts of the machinery made of the metal or its alloys, such as brass or bronze, or sometimes the water used for processing contained traces of copper compounds probably originating from similar sources. In addition, the wool itself nowadays may contain some combined copper derived from certain sheep dips in which copper sulfate is being increasingly used.

The author explains that sheep farmers use copper sulfate for different purposes as follows: .035% solutions as a bacteriostat; 0.2% as a dip to prevent or cure mycotic dermatitis; and 10% or more as a bactericide in foot-rot baths. Much of the copper on greasy wool is removed by scouring, but an appreciable proportion is resistant to scouring and appears to be chemically combined with the wool keratin.

Copper will combine with "chrome" dyes to form a copper lake instead of, in preference to, the desired chrome lake. As the copper lake frequently has a different color from the chrome lake (it also has reduced fastness properties) the resultant dyeing is off-shade, the degree depending on the relative amounts of dye and copper. Thus a given amount of copper will affect a light dyeing more than a dark one.

There appears to be an absence of published information on the amount of copper required to change the shade of dyes when the copper is already firmly attached to the wool. Experiments described by the author, in which Solochrome Brown M was dyed by the metachrome process on wool containing only 60 ppm of copper, showed that an 0.5% dyeing was completely off-shade, while a 3.2% dyeing was unaffected until the copper content was increased to 100 ppm.

The normal contamination of wool with copper seems to be about 10-15 ppm. Even this small amount is able to interfere with very pale dyeings of chrome dyes.

Certain sequestering agents are now available which have the power of combining with various metal ions to form a soluble complex containing the metal in a unionizable form so that it can no longer react with dyestuffs. For example, ethylenediamine tetraacetic acid is effective in the dyebath against traces of undesirable metals derived from the machine, or in the water used, though a considerable excess is said to be necesary to sequester copper.—WHC

Are Orlon, Dacron, Dynel, etc, the Drycleaner's Problem Fibers?

A E Johnson, *Textile Forum* 10, 17-18, 33-34, December, 1953.

It is perhaps only natural, in the present discussion on the pros and cons of synthetic textile products, that an impression should be gained that the drycleaner must be having his troubles with all the new things on the market. It will doubtless come as both a surprise and a relief to many in the textile trades that actually the new synthetics account for no more difficulty in drycleaning operations than the older fiber classifications, perhaps even less. The record itself shows only particular instances of difficulty, and that in the main, drycleaners handle synthetics in the same way they have always cleaned and refinished garments, in most cases with no knowledge that synthetics are included in the runs.

When properly run, drycleaning is the safest, most efficient means of maintaining the appearance and fitness of all outerwear apparel and most decorative textile furnishings in the home, regardless of fiber content, finish, or construction.

None of the fibers in the whole textile picture are physically or chemically affected by either of the two organic solvents used in drycleaning, i e, Stoddard solvent, a petroleum distillate, and perchlorethylene, a chlorinated hydrocarbon solvent. Textile fibers exposed to these solvents do not swell or soften as do many fibers when immersed in water. Consequently, fabric constructions are essentially stable dimensionally when agitated in solvent as compared with washing in water.

Drycleaning solvents alone have limited detergency properties, however, and most cleaning systems employ a drycleaning soap or synthetic detergent with a small amount of water. In the modern "charge system" method of cleaning, the water and detergent combine in such a way as to actually go into solution with the solvent. Thus good cleaning of both water-soluble and solvent-soluble soil commonly present in apparel are removed. Despite the water additions, however, the garments being cleaned do not acquire by absorption any more water at the most in properly run cleaning systems than they do when the atmosphere has a relative humidity of 75 per cent at room temperatures.

It can be seen, then, that drycleaning systems by their very nature provide maximum safeguards against the effects of water on textiles, while at the same time accomplishing good cleaning results. Except in those rare instances where dyestuffs are chemically affected by organic solvents, and with certain other exceptions (e g, relaxation shrinkage), most fabrics withstand modern drycleaning methods of washing apparel quite satisfactorily.—WHC

NEWS

• 3rd Southern Municipal and Industrial Waste Conference Attracts Largest Attendance

"Clean Streams in Our Southern Economy" was the theme of the Third Southern Municipal and Industrial Waste Conference, which attracted a record attendance of approximately 200. The conference, the locale of which rotates annually among Duke University, the University of North Carolina, and North Carolina State College, was held at Raleigh, N C, on March 18-19.

Highlighting this year's program was a panel discussion on the legal aspects of stream pollution and a morning session on industrial, municipal, and educational institute research studies of industrial wastes. Also included for the first time was a separate session on contemporary design criteria for sewage and waste treatment plants.

At the Textile Session, held on Friday, March 19th, Walter A Gardner, water treatment engineer for Fieldcrest Mills, Spray, N C, moderated. Featured speakers included Prof Percival Theel, chairman of AATCC Committee on Stream Pollution, who spoke on "AATCC Stream Pollution Committee's Activities and Objectives"; W R Steele, manager, Textile Section, Solvay Process Company, on "Application of Flue Gas to the Disposal of Caustic Textile Wastes"; and N S Chamberlain, sanitary chemist, Wallace & Tiernan Co, on "Application of Chlorine and Treatment of Textile Wastes".

Ben Cone, Cone Mills Corporation, Greensboro, N C, served as guest speaker at the Annual Banquet on Thursday. His subject was "Industry Looks at the Stream Sanitation Progress".

• Foxboro Factory Nears Completion in Dallas

A new branch factory now being erected at 11710 East Northwest Highway will double the Dallas facilities of The Foxboro Company, Foxboro, Mass.

Scheduled for occupancy on April 30, the new building will provide 13,000 square feet of space for increased instrument manufacturing activities, service and repair, and centralized warehousing of instruments and control valves, in addition to enlarged quarters for the sales office.

The new plant is designed on a single level. In addition to other Texas sales offices, the company maintains emergency repair shops in Houston, Corpus Christi.

Montague, Michigan, Plant of Hooker Electrochemical Co.

• Hooker Begins Operations at Montague

Operation of their new $12,000,000 caustic-soda-chlorine plant at Montague, Michigan, was begun on March 17 by Hooker Electrochemical Co, Niagara Falls, N Y. Located on White Lake adjoining Lake Michigan, less than 200 miles from Chicago, the new plant provides a midwest manufacturing center for Hooker, which also has large plants at Niagara Falls and Tacoma, Wash.

The plant will supply 50% and 73% liquid caustic soda and liquid chlorine in tank cars to various industries. Caustic soda also will be shipped in bulk by barge direct to customers as well as to the company's storage facilities on the Illinois Waterway at Lake River Terminal near Chicago for local distribution.

In addition, the plant is expected to be a nucleus for other chemical manufacturing plants desiring its basic chemicals. It was recently announced that E I duPont de Nemours and Co, Inc and Union Carbide and Carbon Corp plan to build large chemical plants on adjoining sites.

Hooker produces about 100 different chemicals, all of which use caustic soda, chlorine or by-product hydrogen in their manufacture.

NOTE

DUE to a printing error, the Hilton-Davis Chemical Company is incorrectly referred to as the Hilton-Davis Sales Company in a paragraph of the Hilton-Davis ad appearing on page 23A of this issue. The correct name for the Hilton-Davis Company is given in the signature of this advertisement.

• PC&C Doubles Pyridine Capacity

The Pittsburgh Coke & Chemical Company, Pittsburgh, Pa, has announced a 100% increase in the productive capacity of its pyridine plant.

In making the announcement, Alan S Evans, manager of the company's Coal Chemicals Division, said that the move was made to "alleviate the critical shortage of pyridine that has existed for some time".

• Metro-Atlantic Officers

Joseph Buonanno, president has announced the following list of officers for Metro-Atlantic, Inc, Centredale, R I:

Joseph Buonanno, *president*
Hugh J Bonino, *vice president, secretary and treasurer*
Henry Papini, *vice president*
Bernard Buonanno, *1st ass't vice president, ass't secretary and ass't treasurer*
James Shore, *ass't vice president*

Mr Buonanno, in making this announcement, stated that Ernest Nathan, formerly chairman of the board of directors and treasurer of Metro-Atlantic, Inc, had resigned. Further, Mr Buonanno noted that Metro-Atlantic's New York office had been closed and that functions formerly performed from the New York office had been transferred to Metro-Atlantic's Paterson, New Jersey office.

Other than these changes all operations of Metro-Atlantic, Inc and its subsidiary Metro-Dyestuff Corporation will continue as in the past. It was reported, however, by Mr Buonanno that Metro-Dyestuff Corporation is expanding its facilities to provide broader services.

• Rohm & Haas Builds Chemicals Plant in Canada

Otto Haas, president of Rohm & Haas Company, Philadelphia, has announced that construction of a Canadian plant is underway at Scarboro, near Toronto, Ontario. Rohm & Haas Company of Canada Ltd, a wholly-owned subsidiary, will manage the plant as part of a long-term program aimed at expanding its growing Canadian business.

• GDGA Takes Steps to Solve Orlon-dyeing Problem

Through cooperation, study and considerable experimenting, members of the Garment Dyers Guild of America have succeeded in attaining a good degree of success in the redyeing of Orlon garments through new pressure-dyeing methods.

A new pressure-dyeing machine has been made by the B & G Machinery Company of Indianapolis working with John Egli, president of the General Dyeing Company, Inc, of the same city. This new machinery is being installed in the General Dyeing Company plant.

• ACCCE to Conduct Waste Symposium

A symposium "Waterborne and Airborne Wastes" will be held at an open-door dinner meeting of the Association of Consulting Chemists & Chemical Engineers, Inc, on April 27 at the Hotel Belmont Plaza, New York, N Y. The guest speakers will be Harry A Faber, associate editor of *Water and Sewage Works,* and William G Christy, consulting engineer. Roger G Blum of Jos K Blum, consulting engineers, New York, will act as moderator. Discussion from the floor will follow presentation of papers.

• New 4-Year Scholarships Offered at PTI

A national scholarship program offering eighteen full tuition four year scholarships for high school students was announced last month at the Philadelphia Textile Institute by Donald B Partridge, dean of students.

Applications for these scholarships, worth $1,800 each, should be filed before May 15th, 1954 at the college, School House Lane and Henry Avenue, Philadelphia 44, Pa.

"Any senior in the upper third of his class, meeting the entrance requirements of the Philadelphia Textile Institute, is eligible", stated Mr Partridge, "and the scholarships will be competitive based on entrance tests and his high school record".

Quality-control procedures to insure high standards in dye manufacture were reviewed first hand at the Rensselaer, N Y, plant of General Aniline & Film Corporation, by a group of 160 sales representatives at a recent three-day conference. The group, representing General Dyestuff Corporation and Antara Chmicals, sales divisions of General Aniline, were drawn from 26 major cities and 18 states. In this instance, the visitors are looking over skeins of wool showing an application of "Rhodamine 6G", one of the bright pink fluorescent dyes. In the photo, Frederick H Rabe (third from left), production chemist at Rensselaer, tour guide, is shown with GDC representatives (clockwise): Joseph R Ellis, laboratory director at Charlotte, N C; William L Fickert, laboratory director at Philadelphia, Pa; Ernest Empting, Philadelphia, Pa, salesman; James E Flint, Charlotte, N C, salesman; and Anthony Fassnacht, of Providence, R I, New England salesman.

• Ahco Expands Sales Service Laboratories

Arnold, Hoffman and Company, Incorporated are enlarging their Sales Service laboratories in Providence, Rhode Island by the addition of a new pigment laboratory and expansion of their Analytical and Development Section.

The new pigment laboratory, which is expected to be in full operation this month, will provide complete color matching services to producers of solution dyed rayon.

• Celanese Program Aimed at Developing Designing Talent

A nation-wide program to encourage the development of American textile designing talent and to increase the volume of new fabrics for commercial production has been inaugurated by Celanese Corporation of America in co-operation with the country's leading textile schools.

Representing a concerted effort in the direction of achieving national recognition for young American designers, the Celanese Award for Fabric Creation will grant national and local prizes on an annual basis. The competition is open to all enrolled students in textile schools affiliated with the National Council for Textile Education.

Eight schools have indicated that they will participate in the Celanese-sponsored program. They are: Lowell Technological Institute; Rhode Island School of Design; Bradford-Durfee Technical Institute; Philadelphia Textile Institute; Clemson Agricultural College; North Carolina State College; Alabama Polytechnic Institute and New Bedford Institute of Textiles and Technology.

The national award will consist of a three-day all-expense-paid trip to the New York market and to meet textile executies. Cash awards also will be made at each school from which four or more entries are submitted. All designs deemed suitable will be marketed, and efforts will be made to identify the student designer and his school with the promotion of the fabric.

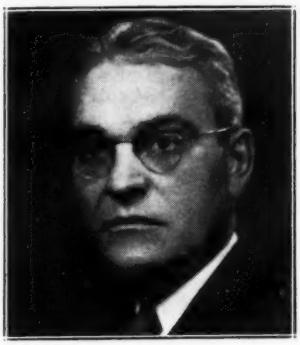
All entries in the 1954 Celanese Award for Fabric Creation must be submitted before May 15, and announcement of results will be made on June 1.

In order to qualify for a prize the fabric sample must be directly related to some existing or future end use in a practical sense in women's wear, children's wear, men's wear and home furnishings.

No limitation is placed on the use of commercially available yarns to produce fabrics. However, all fabrics entered must be of, or contain a substantial portion of, Celanese brand yarns or fibers. Celanese Corporation of America will supply a variety of its own yarn types in reasonable quantities to each student and, in addition, will arrange to procure other than Celanese acetate or rayon for a blend or combination fabric.

Among the points considered in judging the entries will be originality; suitability for use; beauty of texture or pattern; adaptability to fashion; draping qualities; color combinations, and workmanship. In handwoven entries the ease of translation to power loom production will be an additional consideration.

NAMES IN THE NEWS



K S Johnson

ON March 1st, KENNETH S JOHNSON joined McKiernan-Terry Corp as chief engineer of the Textile Machinery Division. For the past 30 years he has been associated with several of the largest Eastern textile finishing plants in a similar capacity. His experience in design and operating conditions will be devoted to the Corporation's expanding program of textile machinery manufacture.

HARRY B McCLURE has been appointed president of Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, succeeding J G DAVIDSON, who becomes chairman of the Company and a member of the Appropriations Committee of Union Carbide. Mr Davidson is also a Vice-President of Union Carbide and Carbon Corporation.

Mr McClure's first position with Union Carbide was as a research fellow on the Carbide and Carbon Chemicals Fellowship at the Mellon Institute of Industrial Research, Pittsburgh. He served as a technical representative for Carbide and Carbon in the Philadelphia area, and was later assigned to sales development work in New York. In 1936 he became manager of the Fine Chemicals Division. In 1944 he became a vice-president of the Company and was appointed executive vice-president in June, 1953.

* * *

In Carbide's Textile Fibers Department, FREDERICK W NYSTROM has been appointed to act as a technical sales representative for the Company's textile fiber, Dynel, in the Chelmsford, Mass, office serving the New England area. Mr Nysrom had served in various fabric sales capacities in the Textile Division of the United States Rubber Company since June, 1951.

RICHARD S BRISSETTE, who has been a sales representative at Chelmsford since June 1952, is being transferred to the New York office, where he will assist in the development of new uses for Dynel.

A G Tew

ARNOLD G TEW has joined the sales staff of Carbic Color and Chemical Company, Inc, and will cover accounts in southern and western New England.

Mr Tew was 32 years with Ciba Co, Inc before joining Carbic on February 1.

OBITUARY

W E Lincoln

WARREN E LINCOLN

WARREN E LINCOLN, 54, New England manager of Nyanza Color & Chemical Co, died suddenly at his home in Waban, Massachusetts on March 3.

Mr Lincoln was an alumnus of Bradford Durfee Technical Institute and attended Harvard in the Chemical Warfare Training Detachment during World War I. He started his career as a chemist for E I du Pont de Nemours & Co, Inc, Wilmington, Del, in 1919. He later became associated with the Atlantic Dyestuff Corp, Portsmouth, N H as chief plant and application chemist, later becoming a sales representative for this firm. In 1926 he joined the sales organization of Chemical & Dye Corp of N E which combined with Nyanza Color & Chemical Co, Inc in 1929. Mr Lincoln became New England manager in 1938.

He is survived by his widow, a daughter, and a son.

F F Jacobs

THE appointment of FRED F JACOBS to the technical sales staff of Nova Chemical Corp was recently announced.

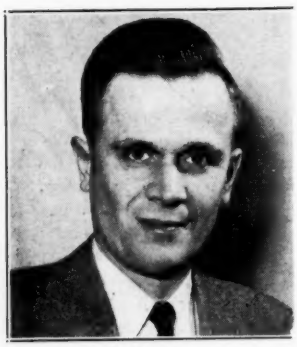
Mr Jacobs, author of the book "Textile Printing", comes to Nova with extensive experience, comprising many years as head of the Textile Printing Division, General Dyestuff Corp, and later as technical director of the Aspinook Corp. Most recently he was director of research and development for Ciba Co, Inc.

WILLIAM N WILLIAMS, head of the Westvaco Mineral Products Division of Food Machinery and Chemical Corporation, was elected a vice president of the corporation at a recent board of directors' meeting at FMC's corporate offices in San Jose, California.

As a management staff member of the former Westvaco Chemical Corporation, Mr Williams became associated with Food Machinery in 1948 when Westvaco was merged into FMC and reorganized as an operating division of the parent corporation. In December 1953, he was placed in charge of the newly formed Westvaco Mineral Products Division following the reorganization of the former Westvaco Chemical Division into two distinct organizations: Westvaco Mineral Products Division and Westvaco Chlor-Alkali Division. Prior to that, Mr Williams was vice president in charge of operations of the Westvaco Division of FMC.

DEAN HENRY EYRING of the University of Utah Graduate School, one of the nation's foremost theoretical chemists and an authority on textile chemistry, delivered the 1954 Edgar Fahs Smith Memorial Lecture on March 18th in the Museum of the University of Pennsylvania. The Lecture is sponsored jointly by the University and the Philadelphia Section of the American Chemical Society. Dean Eyring discussed "The Kinetics of Processes at Electrodes".

J H Bahlburg



F M Zorn

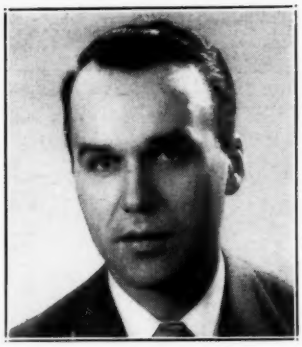
JOHN H BAHLBURG has been named manager — new products, Organic Chemicals Department of Wyandotte Chemicals Corporation, Michigan Alkali Division. Wyandotte's primary purpose in establishing the new Department is to simplify the transfer of new products from the research and development division to sales.

Mr Bahlburg joined Wyandotte in 1946 as a sales representative. The responsibilities of his new position will encompass packaging, handling, labeling and shipping procedures as well as dissemination of overall product information regarding new organic products from research.

Additional news from Michigan Alkali Division concerns the appointment of F M ZORN as assistant to the sales manager, general products, inorganic chemicals. Mr Zorn has been with Wyandotte for 15 years and prior to his new appointment was manager of the order and scheduling department. L M W BEHM, with Wyandotte since 1910, succeeds Mr Zorn to the latter post.

SCOTT STARKEY has been named to represent the Division in Texas, Oklahoma, Louisiana and Arkansas as Southwestern sales representative.

HENRY B ZIEGLER has joined Wilson-Martin Division, Wilson & Co Inc, Philadelphia, as sales manager. Mr Ziegler has an extensive sales background in industrial chemicals, synthetic resins and fatty acids. His most recent connection was with E F Drew & Co.



W F Okey

WILLIAM F OKEY has been appointed to the sales staff of Ciba Co, Inc, Charlotte office. His previous affiliations have been with Wrenn Hosiery Co, Thomasville, N C, and Burlington Mills Corp.

GENERAL ELECTRIC COMPANY has announced the appointments of VERNON R CHILDRESS as manager — marketing research and product planning for the Chemical Materials Department at Pittsfield, Mass, and EDWARD A KERN as manager — engineering for the Silicone Products Department, Waterford. N Y.

Mr Childress has been with G E since 1950, most recently as manager of sales analysis and planning for the Chemicals Materials Dept.

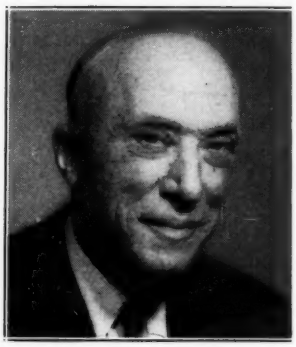
Dr Kern has been associated with laboratory research activities at G E's Transformer Division in Pittsfield since 1942. He leaves his post as manager — Materials and Processes Laboratory at Pittsfield for the new assignment.

WILLIAM L MILHEIM, WILLIAM B SINCLAIR, W D MATTHEWS and J W MORTON, all of whom have been connected with the sales department of the Chemical Division of Celanese Corporation of America for varying periods, were promoted to district sales managers on March 1.

Mr Milheim is in charge of the southeastern district with offices in Charlotte, N C. Mr Sinclair is district manager for New England with offices in Boston, Mass. Mr Morton and Mr Matthews are metropolitan and mid-Atlantic district managers, respectively, with offices in New York.

EDWARD M SIMON, JR, has joined Atlas Powder Company's textile chemicals research staff at the Central Research Laboratory, Atlas Point, Del. Prior to coming with Atlas, Mr Simon had been with American Viscose Corp, Marcus Hook, Pa, as supervisor of research and development work on rayon tire yarn and tire cord.

H Sokol



P Furman

HERMAN SOKOL was elected vice president in charge of research and development of Heyden Chemical Corp at the March 15th meeting of the board of directors. Dr Sokol, who has been associated with Heyden for the past 10 years, was elected assistant vice president in 1953.

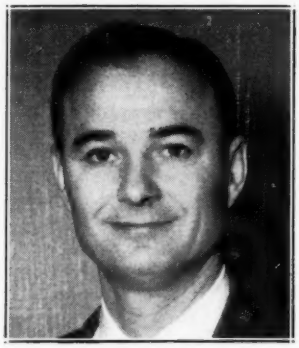
* * *

PRESTON FURMAN, who has served Heyden continuously for 52 years, including 34 years in the Heyden Sales Department, covering New Jersey and other territories, retired on March 1st.

In 1952 Mr Furman was elected the first member of the Heyden 50-Year Club. For the past two years he has served the Corporation in a special sales capacity.

THE appointments of C L PETERSON as divisional vice president of the Brown Instruments Division of Minneapolis-Honeywell Regulator Company and O B WILSON as general sales manager were announced recently.

Mr Peterson, who had been general sales manager of the division since July 1952, will devote the major part of his time to sales policy matters and long-range planning. In addition, he will assist H F DEVER, Division president, in carrying out managerial duties at the policy-making level. Mr Wilson, industrial instruments sales manager since January 1953, will assume active administration of the entire divisional sales department.

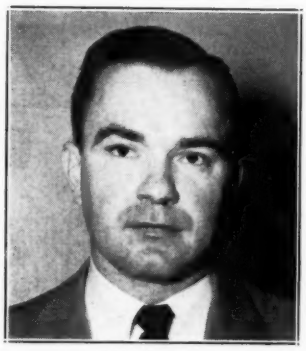


H R Bishop

T F Yuschik

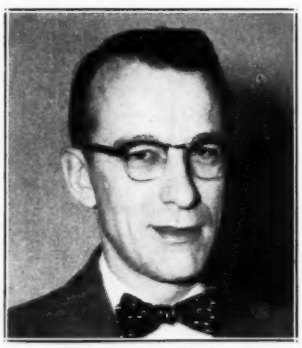
W J Siemans, Jr

P L Sheppard



C D LaSusa

W C Sowers



J F Richenaker

R S Haley

J A Funk

RECENT appointments in its Chemical Division sales organization have been announced by Armour and Company, Chicago, Ill, as follows:

H R BISHOP — manager of fatty acid sales. Mr Bishop joined Armour three years ago as a sales representative in the Milwaukee territory.

T F YUSCHIK — industrial oils sales manager. Formerly assistant manager of fatty acid sales, Mr Yuschik joined Armour in 1946.

P L SHEPPARD — manager of the newly formed Western sales region comprising the central and midwest territories.

R S HALEY — assistant manager, fatty acid sales.

J F RICHENAKER — sales representative, St Louis territory.

C D LASUSA — transferred to Chicago from St Louis to handle fatty acid derivatives sales to the petroleum industry.

THE appointment of four product sales managers and the promotion of two other members of Monsanto Chemical Company's Plastics Division sales department was announced on March 1st.

The sales managers with their product groups are: S F SYLVESTER, textile resins; F E WOODILL, sheets and Vuepak; M G CAINE, Opalon resins; and J B CLOPTON, monomers.

At the same time, J D KIRK was named manager of sales training and ROBERT F HILL was appointed assistant sales manager of Opalon resins and compounds.

HELEN S MELLIN has completed her second year as president of Mellin Chemicals, Inc, Ridgewood, N J, which was founded in 1946 by the late Nelson F Mellin.

AFTER many years of serving its northern Ohio accounts through Schibley and Ossmann, Inc, Emery Industries, Inc, Cincinnati, has opened a direct sales office and warehouse in Cleveland.

WILLIAM J SIEMENS, JR, who has been handling specialty products in the northern Ohio area, and WILLIAM C SOWERS have been assigned to the new Cleveland office. They will be responsible for the sale and service on all Emery products, including fatty acids and derivatives, plasticizers, textile oils and emulsifiers.

Because of Mr Siemens' increased responsibility, the southwestern Pennsylvania and West Virginia portion of his previous territory will be added to that of JAMES A FUNK, operating out of Cincinnati.

M L Fillippeli, Jr

M L FILLIPPELI, JR has joined the technical sales staff of Emkay Chemical Co, Elizabeth, N J, and will represent the Company in Virginia and the Carolinas, working out of Greensboro. Mr Fillippeli has spent 2 years with Burlington Mills in the Developing and Finishing Dept in Greensboro, and five years with Onyx Oil & Chemical Co.

R E Echols

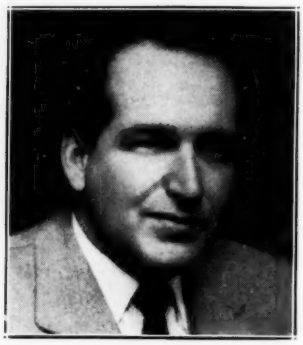
ROBERT E ECHOLS has been named sales representative of the Oronite Chemical Company. From headquarters in Atlanta, Mr Echols will cover territory extending from Atlanta to Birmingham, Chattanooga and Knoxville, Charlotte and Greensboro and Miami.

Mr Echols has been with Standard Oil Company of California (of which Oronite is a subsidiary) since April, 1947.

F B deLoach

FRANCIS B DELOACH has joined the Warp Sizing Division of Seydel-Woolley & Company, Atlanta, as a sales representative. He will make his headquarters in Spartanburg, S C, and call on mills in the Carolinas.

Prior to coming with Seydel-Woolley, Mr deLoach had been doing sales and service work in allied lines.



N Duckworth

NORMAN DUCKWORTH has assumed duties as manager of the Certified Washable Seal Laboratories of the American Institute of Laundering, Joliet, Ill. He worked two years in New York as a textile analyst for the U S Bureau of Customs before joining the trade association's staff.

WILLIAM F GERROW has been named district manager of a newly formed Southeastern territory of The Goodyear Tire & Rubber Company's Chemical Division.

Mr Gerrow will headquarter in Atlanta, Ga, and will supervise all sales activities of chemical materials in Georgia, Florida, Alabama, Mississippi, Tennessee and the Carolinas. Until his recent promotion, he had been serving as a special representative in Atlanta.

LEON E MOODY, director of Duplan of Canada Ltd, has been elected vice president and director of Duplan Dyeing Co Ltd, a wholly owned subsidiary of Duplan of Canada Ltd.

J C Wade

POLYMER SOUTHERN, INC, Greenville, S C, has announced the appointment of J C WADE as manager of its new offices and warehouse in Atlanta.

Polymer Southern will continue to maintain warehouse stocks in its present southern locations in Greenville and Tampa, Florida, and will also continue to maintain its customary use of the facilities of its affiliated manufacturing unit in Springdale, Connecticut.

CHARLES L KLOSS, after 36 years' service, has retired from Rohm & Haas Company, for whom he was the sole representative in the Metropolitan area for a number of years. Mr Kloss was a major factor in the introduction of resins to the textile processors in the area.

He will now be associated with CARL J RAHM in Commercial Products Co, 1137 Main St, Paterson, N J. They expect shortly to produce, under exclusive rights of a pending patent, a flame retarding finish for nylon, and also some other chemical specialties.

R F Spain

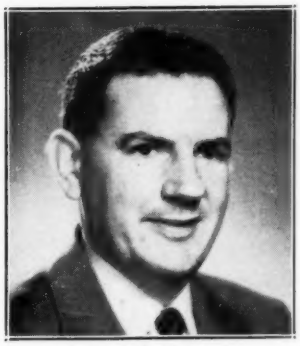
RICHARD F SPAIN has been named Mid-West District sales manager for Nopco Chemical Company. From Nopco's Chicago office, Mr Spain will be in charge of technical liaison and chemical sales.

A Nopco employee since 1941, Mr Spain has served as a chemist in the Company's Control and Sales Service Laboratories, and for the past eight years has been a member of the sales force in Illinois and Iowa. His new duties include heading Nopco personnel in 12 Mid-Western states.

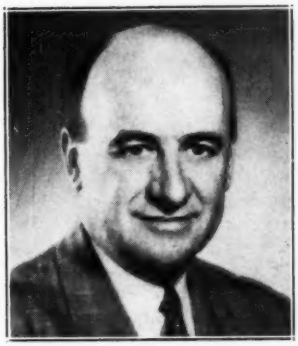
ISADORE PETERS has joined Warwick Chemical Company Division, Sun Chemical Corp, as a technical sales representative in the New York, New Jersey and Pennsylvania areas.

Prior to joining Warwick, Mr Peters had served as chief chemist at a prominent dye works, and organic research chemist, National Advisory Commission for Aeronautics. He was associated with the Dexter Chemical Corporation, Tex-Chem Company and Metro-Atlantic, Inc in various sales capacities.

Edwin H Arnold, president of Arnold, Hoffman & Co, Inc, awards watch to Albert Neves, oldest service employee, in recognition of 34 years employment.



D J Eccleston



W A Green

A L Van Wart, Arnold, Hoffman salesman who was one of ten recipients of a special "30-year watch".

Wellington H King, a member of Ahco's New England sales force who was among 19 recipients of "20-year watches".

AT special ceremonies held at their Dighton, Mass plant, Arnold, Hoffman & Co, Inc recently honored a group of employees who had been with the firm 20-30 years or more. EDWIN H ARNOLD, president awarded watches to the following:

30 years and over—MANUEL BRAGA, JOSEPH CARPENTER, ELLIOTT D COLE, ENOCH EDWARDS, MANUEL GOULARD, MANUEL MIGUEL, ALBANO NEVES, THOMAS H ROBERTS, A L VAN WART, and MANUEL WHITE, SR.

20 years and over—JOHN ANTUNES, PAUL BUFFINGTON, LOUIS CARPENTER, WENDELL CAREY, JAMES KENNEY, WELLINGTON KING, LESTER LASSEN, MANUEL LIMA, R P McBEATH, HENRY MENARD, M S MIGUEL, GEORGE PARCHESCO, AUGUST RAPOSA, JACINTO RAPOSA, JOHN P ROGERS, ANTONIO SANTOS, WILLIAM SEEKELL, ROBERT STIRRUP, and HERBERT TRAVIS.

Present at the service award ceremonies were officials of The Imperial Chemical Industries Ltd of London, England, including ERIC BINGEN, ICI overseas director; PETER MENZIES, ICI deputy treasurer and a director of Arnold, Hoffman; and HAROLD SMITH, director of production, ICI Dyestuff Division and a director of Arnold, Hoffman. Mr Bingen spoke briefly expressing his belief that length of employee service was one of the most valuable assets any firm could possess. He followed his remarks by presenting to CHARLES MILLER, works manager at Dighton, a 20-year service watch in recognition of his previous long employment with ICI. Before joining Ahco, Mr Miller was with ICI's Grangemouth plant.

GEORGE M MOISSON, JR, who for the past two years has been with the McGraw-Hill Publishing Co, New York, N Y, as a member of the editorial staff of Textile World, has joined the executive staff of California Hand Prints, Inc, Hermosa Beach, Calif, as assistant to the president in charge of the Division of New Product Development.

NELSON S KNAGGS, vice president in charge of sales of The Hilton-Davis Chemical Co, was elected vice president of the Cincinnati Museum of Natural History following a recent meeting of the institution's board of directors. Mr Knaggs, who has been a director of the Museum since 1949, was also reelected to that position for an additional 3-year term.

Another Hilton-Davis official, CHESTER H ALLEN, director of safety and public relations, has been elected chairman-elect of the American Industrial Hygiene Association. He will serve as the group's program chairman throughout 1954, taking over the office of chairman in 1955.

From Boston comes word of the appointment of DONALD J ECCLESTON as manager of Hilton-Davis Sales Co in that city. A veteran of 16 years in the textile industry, Mr Eccleston was general manager from 1948-1953 of the Warwick Chemical Company Division of Sun Chemical Corp, in charge of sales, manufacturing and product development for Warwick's plants in Rhode Island and South Carolina.

In a further move to expand its activities in the New England area, Hilton-Davis has added WILLIAM A GREEN to the staff of its Boston branch as sales manager. He was formerly associated with Hart Products Corp in technical sales work.

NEW PRODUCTS AND DEVELOPMENTS

Tower Scray

• Tower Announcing New Scray

The Textile Division of Tower Iron Works, Providence 1, R I, is announcing to the trade a recently developed, versatile scray with motor-driven feed rolls. The manufacturer states that this scray can provide continuous, uniform-tension, take-off for the entrance end of processing ranges which feed from rolls of cloth. The motorized scray folds the goods in a ribbon candy plait that is said to permit tangle-free feeding with a minimum of tension. Regardless of how fast the range may operate, the Tower Scray reportedly allows ample time for splicing a new roll without interruption.

The new Tower scray is said to be easy for one man to load and change rolls, and may be readily moved from one range to another. The unit is said to be capable of handling fabrics in a wide variety of weights and widths. Many of its features are covered by patents.

• Sharples Emulsifier Intermediate

Sharples Chemicals Inc, Philadelphia 7, Pa, has announced the commercial availability of Isopropylaminoethanols (IPAE), an emulsifier intermediate, whose oleate soaps are said to exhibit high emulsifying and dispersing power at low concentrations.

It is said to be convenient to use because of its mild odor, high flash point (155°F) and low toxicity, and reportedly is effective at an IPAE:oleic acid mole ratio as low as 1:1.

Isopropylaminoethanols is a balanced blend of isopropylmonoethanolamine, $(CH_3)_2CHNHC_2H_4OH$, and isopropyldiethanolamine, $(CH_3)_2CHN(C_2H_4OH)_2$. The following physical properties are reported: average molecular weight—116; boiling range—110-265°C; pounds per gallon—7.5; color—straw; odor—mild amine; flash point (open cup)—155°F; freezing point— -50°C.

Leveling Barrymount

• Self-Leveling Mountings

Installing and leveling heavy machinery in minutes—without bolting or shims—is now claimed possible with the new series LM3 and LM5 Barrymounts, manufactured by Barry Corporation, 1000 Pleasant St, New York 21, N Y, givnig industrial plants much-needed mobility of machine tools. These new vibration isolators are said to lift a machine foot to the required height for leveling by a simple turn of the attaching bolt. The new isolators are said to spell:

1) *Reduced installation and maintenance costs.* Installations reportedly can be made in up to 90% less time and eliminate repeated tightening of lag bolts.

2) *Isolation of all modes of vibration* —horizontal, vertical, rotational.

3) *Fewer adjustments on precision machinery and fewer rejects.*

4) *Decrease in plant noise level.*

5) *Money-saving mobility.*

The new series LM3 and LM5 reportedly permit height adjustments up to ½ inch, and carry loads up to 4,200 lbs per Barrymount. Other Barry isolators are said to hold from one ounce to 12,000 lbs per isolator.

• "Black Light" Fluorescent Instrument

A new type fluorescent instrument known as "Black Light", available through the Goldak Co, 1544 W Glenoaks Blvd, Glendale 1, Calif, is finding increasing acceptance in the trade.

Specifications include: R V 6-watt ultraviolet lamp, portable carrying case, shoulder strap, extra 360BL G E replacement tube, two 45 volt standard Eveready batteries, six 1-ounce-size fluorescent compounds, green and red dusting powder, fluorescent white fingerprint powder, invisible marking pencil. Dimensions: 5x7x12½". Weight: 10 lbs, 15 lbs shipping.

W & L E Gurley Permeometer

• New Permeometer

A new model portable Permeometer for measuring the porosity or air permeability of materials too porous to be tested accurately or conveniently with a densometer is now available from W & L E Gurley, Industrial Division, Troy, N Y.

The Permeometer is said to measure air flow from less than one to about 400 cubic feet of air per minute, per square foot, at a pressure drop equal to 0.5 inches of water.

The Gurley instrument may be used to test cloth in which the ability to pass air is a use-requirement, such as parachutes and vacuum cleaner bag materials. It also finds application in evaluating cloth used as a filter, selecting clothing materials for coolness or warmth or predicting the penetration into cloth of various coatings. Other uses include the measurement of retention of fillers, starch or sizing after laundering or cleaning; predicting the water-resistance properties of fabrics; and measuring the compactness, nap or other properties of cloth after fulling, washing, sizing and other treatments.

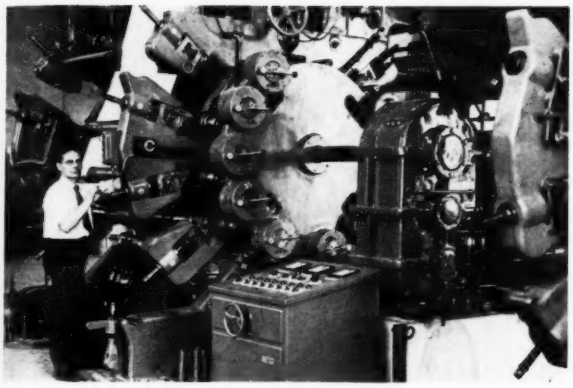
Routine tests may be made in less than 15 seconds, it is claimed. The motor operates on a c or d c from 25 to 60 cycles, 115 volts.

For further information write for Bulletin 1400.

• Appearance-Retention Tester Commercially Available

The "pilling" machine developed by the U S Navy Clothing Supply Office for routine control and acceptance testing of woven and knitted fabrics (cf *Am Dyestuff Reptr 42,* No. 26, 895—Dec 21, 1953) is now available from Fabric Development Tests, 185 Twenty-Sixth St, Brooklyn 32, N Y.

The machine is said to test most fabrics in 3-10 minutes and can be run wet or dry. Results are said to agree very well with actual pilling in wear.



(Above): Chromalox Electric Radiant Heating Panel

(Left): Kleinewefers Roller Print Machine

• High Efficiency Roller Printing Machine

An important step forward in the direction of an automatic roller printing machine without changing approved principles of printing was undertaken by Joh Kleinewefers Sohne of Krafeld, Germany, immediately following World War II and today their high efficiency roller printing machine is enjoying increasing popularity.

The machine is said to offer the following advantages:

1) new semi-automatic register adjustment with adjusting gears.

2) a swinging arrangement for the ratio gear casings; two sets of ratio gears are required for the complete range of print roller diameters used.

3) perfect functioning of all doctor blades, which have their own independent motor drive, regardless of the speed at which they are operated.

4) a machine equipped with roller bearings for higher operating speeds (85+ ypm), lower power consumption and smoother operation.

5) fully enclosed gearing.

6) perfect control of all operating parts.

• New Line of Chemical Pumps

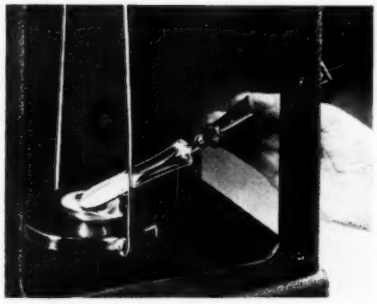
The Roy E Roth Co, Rock Island, Ill, has announced a new line of end-mounted chemical pumps for acids, caustic solutions, solvents, and liquefied gases.

The line consists of 27 models suitable for heads up to 600 feet in a single stage and capacities from 1 to 100 GPM.

All models are equipped with high-pressure flanged connections and are available in 316 stainless steel, 304 stainless steel, cast carbon steel, Hastelloy "C", Durimet 20, and nickel, as well as bronze and cast iron.

Seven different types of mechanical seals are furnished, each in several combinations of metals and gasketing.

Each model is rated individually for its NPSH characteristics at a variety of discharge heads.



Fischer Vibro-Spatula

• Midget Vibration Motor Permits Dead-Stop Control in Spatula Dispensing

A familiar laboratory tool, the spatula, has been combined with a midget vibration motor to speed up and add accuracy to laboratory weighings.

With the Vibro-Spatula, manufactured by Fischer Scientific Co, Pittsburgh, Pa, particles can be dropped, singly, in a steady stream, or in rapid bursts, onto the weighing scoop or paper. The motor reportedly vibrates a stainless-steel spatula 60 times a second. Another application of the unit is in breaking up loosely bound aggregates of crystals.

The Vibro-Spatula uses 115-volt 50-60 cycle ac. U S price: $12.50.

• Zalon Nonionic Detergent

Zimmerman Associates, Chemists and Engineers, Guilford College, N C, have begun commercial production of a new nonionic detergent, Zalon. Two grades will be manufactured—a regular commercial grade for the textile, general cleaning, and oil additive trades, and a specially refined product for the cosmetic industry for shampoos and emulsifiers.

Zalon is said to be soluble to a degree in most oils, including lubricating oils. An outstanding feature of this detergent is the very soft hand it imparts to textiles. It also serves as a wetting agent and dyeing assistant.

Zalon is sold as a 100% active product in 55-gallon steel drums.

• New Heavy-Duty Infrared Generator

A new heavy-duty infrared generator for high-intensity heating requirements has been introduced by Edwin L Wiegand Company, 7500 Thomas Blvd, Pittsburgh, Pa. The generator—a Chromalox electric radiant heating panel—has been especially designed and constructed for web-fed processes in the textile, paper, and plastics industries.

Measuring 66" x 12", the new panel has been built to span large webs and is an addition to a wide range of other Chromalox far-infrared equipment.

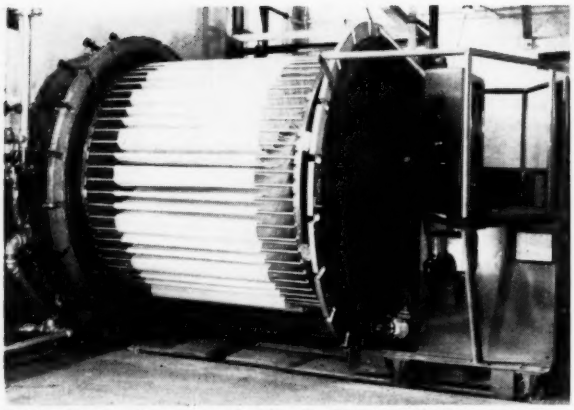
It is claimed that quickly absorbed, "color blind" far-infrared radiation at its highest intensity—2.7 kilowatts per square foot in the standard model—is distributed with extreme uniformity over extended areas, even at closest work spacings. Output reportedly can be controlled from 4% to 100% of 15 kilowatt capacity, with element temperature up to 1450° F. Standard voltages are 240 and 480, while special panels of other watt ratings and voltages up to 600 volts can be made to order.

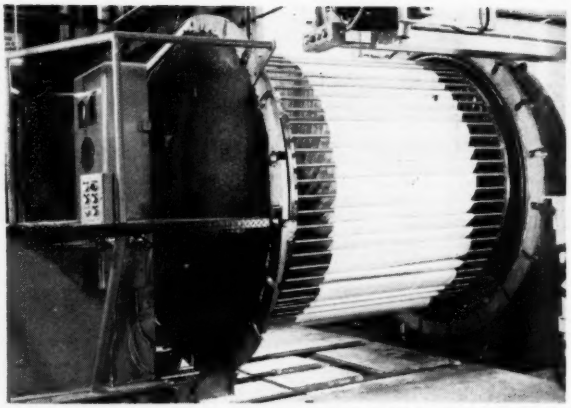
The panel is said to be ideally suited for giving work an initial "hot kick" to quickly reach the best drying or curing temperature.

A thread finishing mill reportedly heat-sets 3000-yard-per-pound nylon at 42 yards per minute in only two seconds. It is claimed that uniform heating sets the yarn at 15-16% elongation to break with over 9 lbs breaking strength.

Some of the suggested uses of Chromalox Radiant Panels in the textile industry include: heat setting, heat stretching, tenter preheating, hot flue pre-treating, singeing, curing resin finishes, preheating and heating aftertreatment in dyeing Dacron with vat acid, permanent calendering and embossing.

Further information is available in Folder CS-606, "Faster Web Heating," available on request from the manufacturer.





(Left): Hunter Baroter, left side. In this installation, autoclave is set into outside wall to save floor space. Note sampling device (lower right center), which allows inspecting of degree of shade and intensity.
(Right): Hunter Baroter, right side, showing cloth in position for dyeing, overhead loading device, and switch panel.

• Hunter Announces First Commercial Barotor

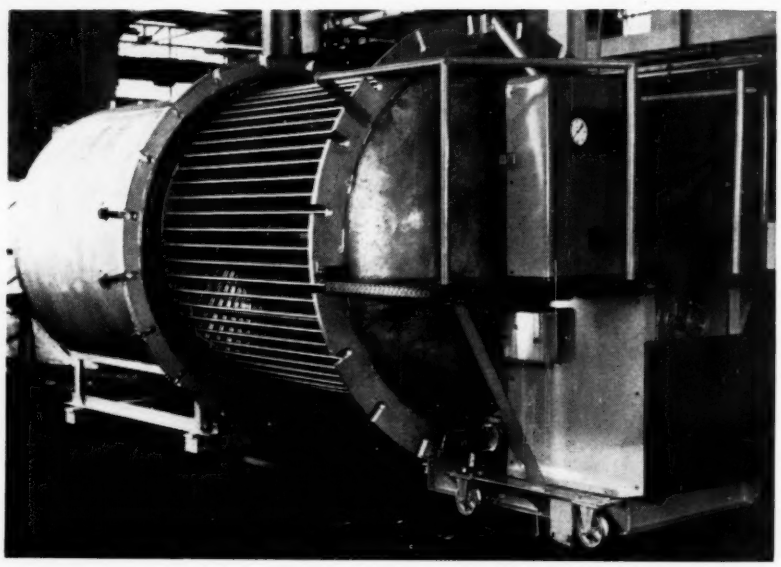
The James Hunter Machine Company, North Adams, Massachusetts, has announced the production of the first commercial Barotor for pressure piece dyeing. This machine is now in operation at the Waldrich Company, Delawanna, New Jersey.

Exhaustive tests at Waldrich on the Barotor, which was developed by the DuPont Textile Fibers Department, reportedly show that full ranges of shades, including dark shades with superior fastness, are now practical on a wide range of fibers, alone or in combination with cottons and rayons.

It is reported that some fabrics have been dyed on the Barotor in only three hours, without using a carrier, compared with ten or more hours for dyeing the same fabric in a jig or dye beck using a carrier. Quality, levelness, and fastness of the Barotor-dyed cloth are said to be superior. The elimination, in most cases, of the necessity of a dye carrier is claimed as one of the economies effected by the machine.

The Barotor is a horizontal, cylinder-shaped autoclave fabricated from heavy gauge, type #316 stainless steel. The fabric is mounted in open width on a rotor in tensionless condition. One of its primary advantages is said to be its ability to dye the new synthetics under high temperature at an economical speed. In the case of blends, the Barotor reportedly allows high-temperature dyeing of the synthetic content above 212° F, followed by dyeing of the cotton and rayon content at lower temperatures.

It is pointed out that further economy of operation is reflected in savings in steam and water. This is accomplished by a reduced volume of dyebath where dye ratios are drastically decreased, resulting in less steam required to bring the bath up to temperature. A shorter dyeing cycle, plus efficient insulation, promises additional steam savings. Continuous advance of the fabric relative to the bars, combined with rotation of the reel, is said to enable all portions of the fabric to have equal contact with the dye liquor at least once every minute, a major factor in reducing dyeing time compared with conventional dyeing methods. Bar marking of the fabric is prevented by "progression" of the fabric relative to the bars. It is claimed that fabric samples suitable for shade matching can be taken from the Barotor at any time during the dyeing cycle without interrupting the operation or losing pressure. Filament and spun fabrics of such fibers as rayon, acetate, nylon, Orlon acrylic fiber, and Dacron polyester fiber have been dyed successfully, it is claimed.



Hunter Baroter showing autoclave and reel in open position. Reel travel into autoclave is motorized with limit switch control.

Since it was first developed, the Barotor has undergone considerable modification by Du Pont. Spacer bars have been eliminated, which has reduced the total number of bars to 20% of the number used in the original experimental machine. The 128 slots in the rotor heads of the original machine, originally provided to cause the outer bars to rotate, have also been eliminated. The fabric automatically progresses during the dyeing cycle, and the necessity of moving or sliding bars is said to have been eliminated. All outer bars are fixed, and the inner bars are locked in position during operation and automatically released during unloading.

Another feature of the installation is a simplified loading and unloading device, which is said to greatly reduce the time formerly required for these operations.

The second commercial unit is now under construction, and will be installed at the Abbeville Mills Corporation, Abbeville, South Carolina. This will be a 72" machine designed to dye wide suitings.

The Barotor will be displayed by Hunter during the American Textile Machinery Exhibition at Atlantic City, April 26-30.

Commander J Burkhardt discusses the new Drape-Flex Stiffness Tester with J J Press.

• Navy Develops New Fabric Drape-Flex Tester

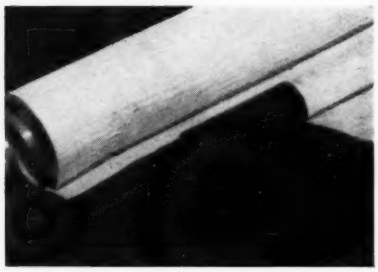
Commander J Burkhardt, Jr, commanding officer, Clothing Supply Office, United States Naval Supply Activities, New York announces that numerous studies have been completed with a device which measures how a fabric will drape under its own weight and how stiff it will feel when flexed by hand. This new machine, known as the Drape-Flex Stiffness Tester, was developed at the Clothing Supply Office under the direction of Jack J Press.

In carrying out the test, a narrow 6-inch strip of fabric is projected out horizontally over a platform until the free end of the test sample drops down, under its own weight, to a prescribed angle. Drape stiffness is one-half of the projected length of fabric as read directly from a scale. This value when combined with the weight of the sample in a suitable formula gives flex stiffness, the resistance of the fabric to flexing when supported in the hand.

Flex stiffness values with the standard tester are said to have been measured from less than 0.1 x 10^{-4} inch-pounds for plastic film 0.00025-inch thick, up to about 35 x 10^{-4} inch-pounds for the Navy's 30-ounce jersey overcoat fabric and 80 x 10^{-4} inch-pounds for plastic film 0.00-inch thick. For non-apparel materials of still greater stiffness, measurements can be made by increasing the length of the sample strip and attaching a slope extension to the standard tester. A flex stiffness value of 600 inch-pounds is said to have been obtained with a 10" strip of reinforced plastic 0.014-inch thick.

The Navy reportedly is finding the Drape Flex Stiffness Tester very helpful in carrying out its fabric development program, excellent correlation having been found between flex stiffness values and the subjective ranking of the stiffness of apparel fabrics. The puckering of overcoat fabrics in sewing was found to be inversely proportional to flex stiffness. In addition, this measurement, in combination with abrasion values, has been used to predict the rate at which overcoat fabrics become worn and threadbare at folded edges of lapels, pockets, and cuffs.

The new stiffness tester is now described under Method 5206 of Federal Specification CCC-T-191b, Textile Test Methods.



"Skintex" Wrappers

• Improvement in Package Dyeing

Many dyers who have used cotton socks over their spiral springs have noted that much yarn and time is wasted because of snagging on the springs during rewinding. This led to the development several years ago of the Skintex spiral spring wrapper, and the perforated tube wrapper for improved dye penetration.

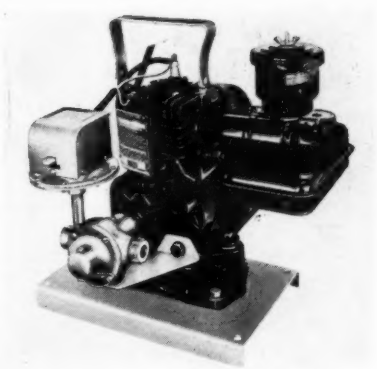
Technical Papers Corp, 25 Huntington Ave, Boston 16, Mass, manufacturers of Skintex wrappers, reportedly have increased their rate of penetration while improving the wet strength for easier handling of fabrics made from natural or synthetic fibers in hot or cold dyebaths.

Wrappers of either type come in sizes 6¾" and 8½".

• Inhibitor for Quaternary Compounds

QAI, a new inhibitor that permits packaging of quaternary ammonium compounds in metal, is said to be completely soluble in water base materials, and is reported to be equally effective as an inhibitor in water-base compounds with a pH 8.0 or higher.

R M Hollingshead Corp, Camden, N J, manufacturers of the new inhibitor, claims that it will not add to the toxicity of manufactured compounds nor limit their germicidal properties. It is said that .05-0.5% QAI will inhibit corrosive properties of most products containing quaternary compound. The manufacturer reports compounds containing as much as 10% quaternary ammonium compound packaged in metal with QAI as an inhibitor shows no signs of corrosion after more than three years laboratory tests. A patent on the use of hydroxypropylamine nitrite for this purpose has been applied for by the Camden firm.



Hypro G 3800 VS portable pump

• New Gasoline-Powered Pump

Portability and functional simplicity are two features of a new gasoline engine-powered pump designed for water or liquid chemical transfer by Hypro Engineering, Inc, Minneapolis, Minnesota.

The hollow shaft pump, Model G 3800 VS, mounts directly on the drive shaft of a Model 5S 1 HP Briggs & Stratton gasoline engine and reportedly will run for 1¾ hours on a tank of fuel. The unit is equipped with a special vacuum switch to guard against "burned out" impellers when the liquid supply runs dry.

The unit weighs 35 lbs, complete with engine, fuel tank, hinged carrying handle and base plate; capacity is up to 8 gallons per minute open discharge; and pressure range is up to 30 lbs. It is said to be able to lift water up to 10 feet unprimed, 22 feet primed, with outside threaded ports to accommodate hose couplings. It reportedly will handle a wide range of liquids on transfer or booster pumping duty.

For additional information write Dep't KP, Hypro Engineering, Inc, 404 No Washington Ave, Minneapolis 1, Minnesota.

• "Sulfstix"

A new pocket-size device for detecting ammonia leaks has been introduced by Nitrogen Division, Allied Chemical & Dye Corporation.

The device consists of "Sulfstix", or long sulfur-impregnated tapers in a container designed to be carried in a pocket or hung on the wall near ammonia equipment.

Ammonia leaks can be detected by lighting a taper and holding it near equipment suspected of leaking. A white cloud will indicate the point of ammonia leakage. The tapers may be extinguished and reused.

The "Sulfstix" device may be obtained free of charge by writing Nitrogen Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, New York.

• Hart Products Announces New Wetting Agent; Water Repellent

Hart Products Corp, 1440 Broadway, New York, N Y, has announced the addition of Penetron Conc, a new wetting agent, and Hartuwet S, a durable water-repellent finish, to their line.

Penetron Conc, which is being marketed as a clear liquid containing 60% active ingredients, is said to possess exceptional wetting-out action at very low cost. Using the Draves test with a 3 gm hook at 40°C, the following sinking times are reported with this product:

Concentration %	*Time in Seconds*
0.05	9
0.04	13
0.03	25
0.025	45

Penetron Conc is reportedly useful in neutral solutions, solutions of alkaline builders, salts, soaps, organic acids, and in dilute sulfuric acid. Suggested applications include its use as a dispersing agent for dissolving dyestuffs to give complete solubility and full color value; for wetting-out in desizing rayon, cotton and acetate goods; prior to bleaching and kier boiling; as an additive to the dyebath on all types of machines and all kinds of colors where increased penetration and uniformity of shade are difficult to accomplish.

Hartuwet S is said to impart an extremely durable water-repellent finish to rayon blends, cotton, nylon, acetate, wool, Dacron, and Orlon fibers. It is described as a very stable milk-white silicone emulsion instantly dispersible in water. Fabrics treated with this new product are said to show an increase in abrasion resistance up to fourfold, a greater tear strength, a marked improvement in sewability, a greater recovery from wrinkling, and an improved crisp resilient hand as well as spot and stain resistance.

Hartuwet S, it is claimed, may be used in combination with the commonly used urea - formaldehyde, melamine - formaldehyde and other resins. It is stated that no disagreeable odors are developed in the course of application, drying, or curing of Hartuwet S. It is further stated that no after-wash is necessary when the new product alone is used.

The manufacturers point out that Hartuwet S is easily applied from the usual padding equipment and is cured in the conventional tenter frame or loop drier.

• Line of Fatty Alcohol Sulfates

American Alcolac is now selling under the name of Sipex a complete series of new technical lauryl sulfates, namely the sodium, magnesium, potassium, ammonium, mono-, di- and triethanolamine salts.

Representative Group of Fluoroflex-T Products.

• Resistoflex Unveils New Line of Plastic Hose and Pipe

Resistoflex Corp, Belleville, N J, recently unveiled its new Fluoroflex-T line of plastic products comprising hose and pipe which, company officials said, is chemically inert to highly corrosive liquids.

In addition, according to Edgar S Peierls, president of Resistoflex, the new Fluoroflex-T plastic products, which are made from DuPont's Teflon, are light in weight and resistant to high and low extremes of temperature.

Peierls disclosed that the new hose is already in production on a pilot-plant basis to meet immediate needs of the aviation industry for handling the new synthetic oils and fuels developed for use on the latest design jet engines. Another application of the hose will be for all hydraulic systems requiring noncorroding conduit.

Commercial production of Fluoroflex-T hose and pipe, the Resistoflex president continued, will be expanded as rapidly as possible to meet the needs of industries confronted with the problem of handling destructive corrosive fluids at high operating temperatures.

Both Peierls and Irving D Press, chief engineer of Resistoflex, emphasized that the new line of products is able to handle practically all corrosive liquids at temperatures from minus 100 degrees up to at least 450 degrees Fahrenheit without any physical, structural or visual changes.

Other properties of the Fluoroflex-T line, Peierls said, in addition to light weight, chemical inertness and resistance to temperature extremes, are high tensile strength and practically unlimited shelf life.

At present Flouroflex-T hose is available in a range of seven sizes from ¼ inch through 1 inch. Three additional hose sizes will soon be added to the line. The laminated pipe is available in 1 inch, 1½, 2, 3, and 4 inch diameters. Special sizes can be produced where requirements are large enough to warrant it.

• Maypon K-903

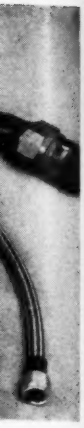
Maywood Chemical Works, Maywood, N J, has anncunced Maypon K-903, a protein-fatty acid condensation product which represents a further development of Maypon K. It is recommended by the manufacturer for application on cotton, rayon, nylon and wool in the form of loose stock, yarn and woven fabric and is said to have superior overall efficiency in wetting, dyeing, scouring, milling and spot removing. In making emulsions, it reportedly has increased compatibility with solvents and oils.

• Add to Functions of Pyrometer Controllers

The range of applications for millivolt-type pyrometer control instruments made by Minneapolis - Honeywell Regulator Company's Industrial Division in Philadelphia has been broadened by the addition of millivolt actuation.

The measuring circuits of the instruments, known as Pyr-O-Vane and Protect-O-Vane controllers, have been modified to permit calibration of the instrument for a number of functions including measuring and controlling speed of rotation, power consumption, pressure, or relative acidity or alkalinity. Reportedly accurate to within one percent, it is stated that the indicating controllers can be used with any sensing element whose output is of the proper order of magnitude. Such elements include tachometers, thermal converters, pH indicators and pressure transducers. Previously the instrument had been designed for use with thermocouples and radiamatic units.

The instrument is expected to be particularly suited for various uses in research or development activities where the extreme sensitivity and versatility of potentiometer type instruments is not required. In such applications thet milli-voltmeter will be satisfactory as well as being more economical.



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